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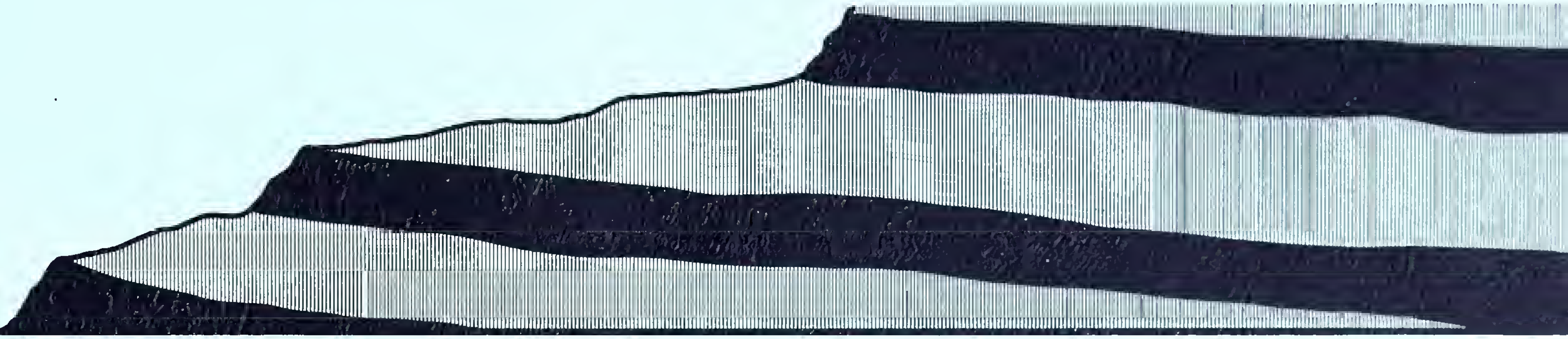
Mineral Resource Report 69

1975

Analyses and Measured Sections of Pennsylvania Bituminous Coals

Part II



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TOPOGRAPHIC AND GEOLOGIC SURVEY
Arthur A. Socolow, State Geologist

Mineral Resource Report 69

Analyses and Measured Sections of Pennsylvania Bituminous Coals

Part II

by Viktoras W. Skema
Thomas M. Berg
William A. Bragonier
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PENNSYLVANIA GEOLOGICAL SURVEY
FOURTH SERIES
HARRISBURG

1975

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PREFACE

This publication is part of a continuing investigation of coal resources in the bituminous coal region of Pennsylvania by the Pennsylvania Geological Survey. The information presented on coal and associated rock units was gathered in the period 1969–74. A similar report, Mineral Resource Report 66, containing data collected in 1966–68, was published earlier.

These reports are beneficial to all concerned with coal development and land-use planning of coal-bearing areas. The data on coal, particularly thickness, chemical analysis, and coking and fusibility characteristics, should be helpful for preliminary evaluation of the potential use of specific coal seams. The lithologic, paleontologic, mineralogic, and structural information should also be generally useful to geologists for stratigraphic correlation and for sedimentary, structural, and other studies. In addition, the report contains information relevant to environmental and engineering studies dealing with such problems as pollution control, engineering construction, efficient mining technology, and urban or rural planning. The previously published Mineral Resource Report 66 contains a brief discussion of some specific applications of the geologic data in these reports to engineering and environmental problems.

The emphasis in this report is on coal characteristics; however, an attempt is made to include other data pertinent to the needs of those concerned with the Pennsylvanian and Permian part of the stratigraphic sequence. This series of publications should benefit a wide audience, particularly since a great deal of the information was collected from surface strip mines which have been backfilled and are now inaccessible.

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ABSTRACT

Geologic information concerning bituminous coals and associated sedimentary rocks, obtained from strip mines and a few drill holes in 20 counties of western Pennsylvania, is presented. Coal data include seam and bench thickness, megascopic description of composition, proximate and ultimate analyses, Btu determinations, free-swelling index, and ash-softening temperature. Other data presented are thickness of individual rock units, lithologic characteristics (gross compositions, grain size, color, etc.), degree of weathering, fossil content, sedimentary structures, fracture orientation, and overburden characteristics.

INTRODUCTION

HISTORY AND PURPOSE

The area included in this report, the western and north-central portion of Pennsylvania, is an area rich in bituminous coal resources. For the past 40 years much of this coal has been mined by open-pit stripping methods. These strip mines have been a very accessible source of important geologic information. Within the past 10 years, however, immediate backfilling of these open-pit mines has been made mandatory as a conservation measure. Consequently, much potentially valuable geologic information has quickly become irretrievable. Recognizing this situation, the Pennsylvania Geological Survey in 1966 initiated a continuing project of collecting the temporarily available information. In this project, detailed examinations of strip-mine highwalls are made, and sedimentologic, paleontologic, mineralogic, and structural features are described. Coal is described megascopically, sampled, and sent to the U.S. Bureau of Mines for a proximate and ultimate analysis, and a determination of Btu, fusibility temperature, and free-swelling index. The results for the proximate and ultimate analysis are presented on an as-received, a moisture-free and a moisture- and ash-free basis. This information is stored at the Pennsylvania Survey in a general stratigraphic file and a coal analysis file which are open to the public. Other stratigraphic data not related to this project, such as drill-hole core logs, are also maintained in this open file.

Publication of the data obtained in this project (along with some drill-hole data which include coal analyses) will make the information more readily available to a wide public audience. However, because of publication space limitations, information about rocks other than coal is summarized or abbreviated. Chemical analysis of coal is given only on an as-received basis, and of the three fusibility temperatures obtained in testing, the initial deformation and fluid temperatures are omitted. All other coal information is published.

LOCATION OF AREA

Bituminous coal in Pennsylvania is found mainly in the Appalachian Plateau province, which is located in the western and northern part of Pennsylvania. There are three coal fields in this province: the Main Bituminous field, which yields the major production of coal in the Commonwealth, the North-Central fields, and Georges Creek field. Bituminous coal is also found in

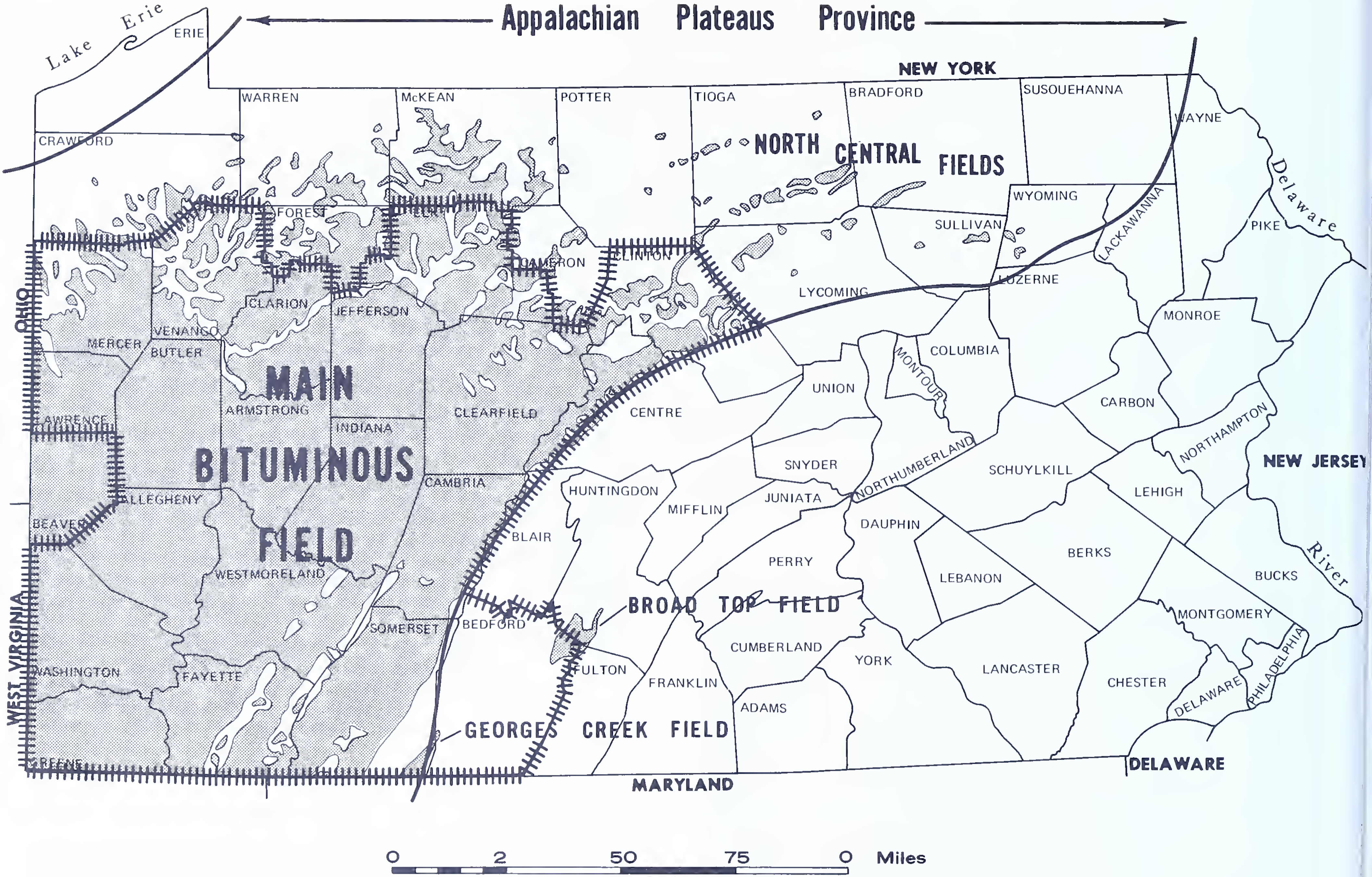


Figure 1. Location of area and distribution of bituminous coal fields.

the Broad Top field, which lies in the Valley and Ridge province. Active strip mines in all but the North-Central fields were visited from 1969 through 1974. The information published here was collected from 20 of the 38 counties in which bituminous coal occurs (Figure 1).

STRATIGRAPHY

The rocks examined in this project are of Pennsylvanian and Permian age. Major rock types other than coal are siltstone, shale, sandstone, and claystone. Limestone occurs as a minor constituent in this sequence of sedimentary rocks. (The lithologic classification system for clastic rocks used in this report is explained in Table 1.) No attempt has been made here to correlate stratigraphic units. The coal names recorded are those reported by the strip-mine operators. A general columnar section which gives the stratigraphic positions of these coals is shown in Figure 2. The coals examined in the Broad Top field are shown on a separate stratigraphic columnar section (Figure 3) because of tenuous correlation between them and the coals in the Plateau fields.

SAMPLING PROCEDURE

Coal samples for chemical analysis were collected whenever possible by using a simple channel sampling procedure. A representative vertical section of the coal seam was selected and cleaned off to expose a fresh face of unweathered coal. Coals that had been exposed to the atmosphere long enough to become deeply weathered were not sampled. A sample of approximately two pounds was taken from top to bottom of each bench in the seam. Care was taken to exclude partings between benches sampled and to exclude any of the rock from above and below the coal. Mineralized lenses and concretions (such as sulfur and siderite) were included in the sample if they appeared to be a persistent component of the bench. The sample was then broken up into approximately 1-inch pieces and placed in a waterproof plastic bag. Samples were generally not in storage longer than 2 months before shipment for testing. Laboratory testing was performed by the U.S. Bureau of Mines in Pittsburgh using U.S.B.M. testing standards.

Table 1. *Lithologic Classification by Fissility and Grain Size*
(after Berg and Edmunds, Pa. Geol. Survey)

	BEDDING	FISSILITY
Dominant grain size	Planes spaced >½"	Planes spaced <½"
Granules and larger	Conglomerate	
Sand	Sandstone	Fissile sandstone
Interlaminated sand and silt	Sand-silt laminite	Sand-silt laminite shale
Silt	Siltstone	Silt shale
Interlaminated silt and clay	Silt-clay laminite	Silt-clay laminite shale
Clay	Claystone	Clay shale

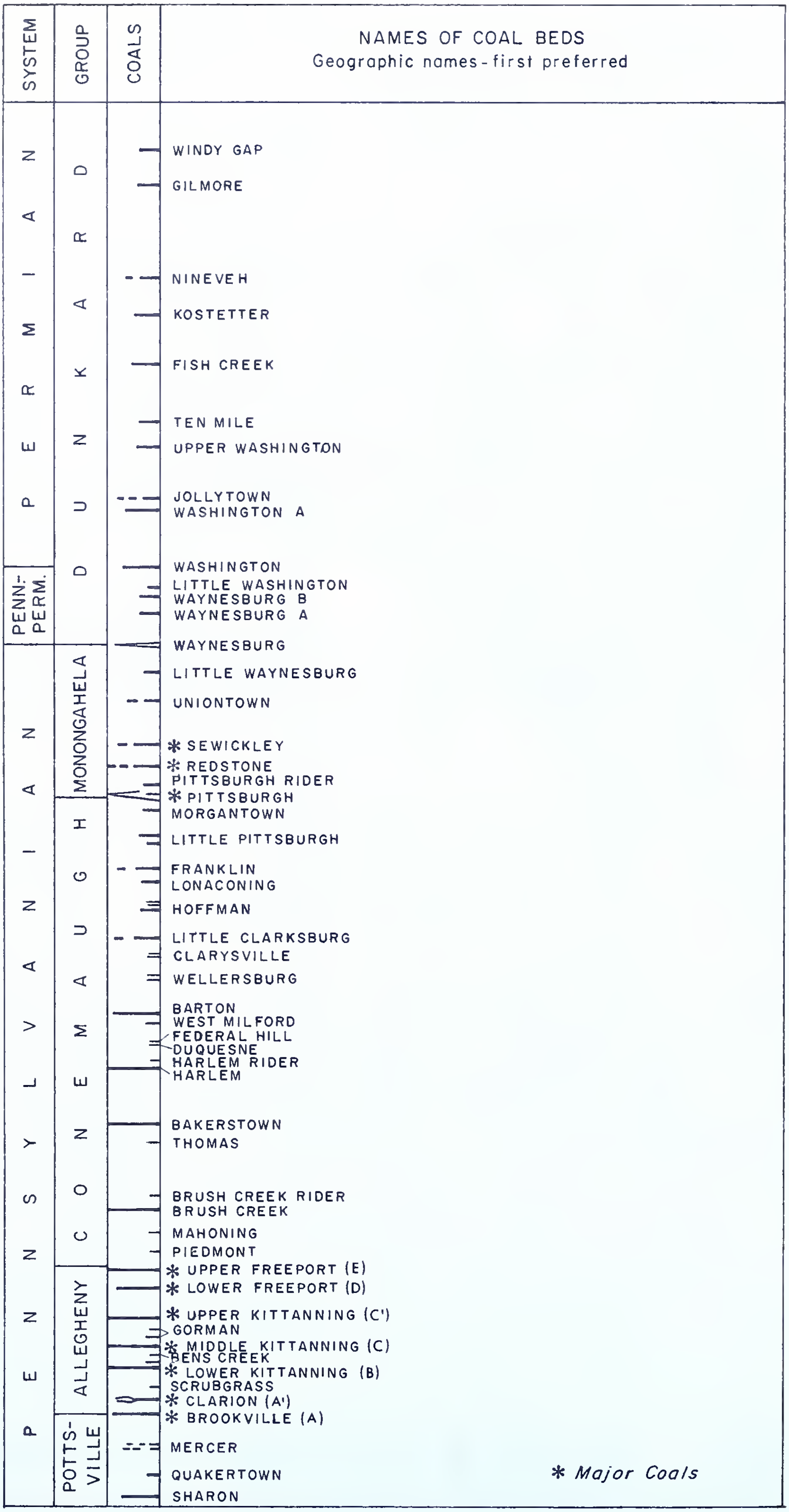


Figure 2. Coals in main bituminous fields of Pennsylvania.

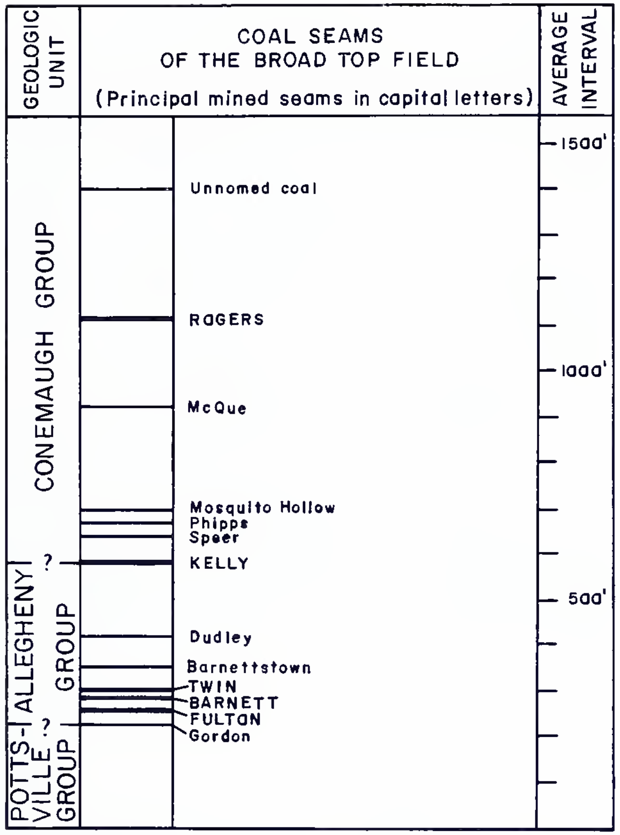


Figure 3. Coal seams of the Broad Top field.

GLOSSARY

Ash: The inorganic residue remaining after ignition of combustible substances in coal. The ash content is determined quantitatively by a definite method prescribed by the American Society for Testing and Materials.

Ash-softening temperature: The temperature at which a coal sample passes through a certain defined stage of fusion when heated at specified conditions as prescribed by the American Society for Testing and Materials.

Banded coal: The common variety of bituminous coal which is composed of a sequence of irregularly alternating layers or lenses of bright vitrain, moderately bright to dull attrital coal (clarain and durain), and soft, powdery fusain.

Bench: Subdivision of a coal based on lithology, partings, and/or minability.

Block clay: A hard, dense variety of claystone with very little plasticity and a semi-conchoidal fracture. It is similar to flint clay, but it is softer.

Blossom (of coal): An extremely weathered coal of indeterminate thickness.

Bone (or bony) coal: Coal that has high ash content. It is hard, compact, and contains between 25 and 50% ash.

Cannel coal: A compact, tough coal that contains spores and that is characterized by dull to waxy luster, conchoidal fracture, and massiveness. It is nonbanded and high in volatiles.

Channel sample: A coal sample obtained by cutting a groove across and perpendicular to the entire thickness of a coal bench being sampled.

Clarain: The microscopically recognizable bright lustrous constituent of coal, which, in contrast to vitrain, has fine dull striations. It is intermediate in luster between vitrain and durain.

Durain: The dull constituent of coal characterized by a gray to brownish-black color and a granular texture.

Fixed carbon: That part of the carbon which remains when coal is heated in a closed vessel until the volatile matter is driven off. In a proximate analysis the amount is obtained by subtracting from 100 the sum of the percentages of moisture, volatile matter, and ash.

Flint clay: A very hard, dense variety of claystone with very little plasticity and a conchoidal fracture. It is economically important as a refractory clay.

Free-swelling index: An indication of a coal's ability to coke, or bind together, when a sample is heated in a prescribed manner. It should not be regarded as a method for determining expansion of coals in coke ovens. The higher the index number the better the coking ability.

Fusain: A black to gray-black, fibrous, silky lustrous, extremely friable constituent of coal.

Moisture: The moisture of a coal calculated by establishing the loss in weight (as a percent of the total weight) when a sample is heated under rigidly controlled conditions as prescribed by The American Society for Testing and Materials. The analyses published in this report were conducted on an as-received basis. Samples were not air dried prior to analysis. Consequently, surface moisture may be included with the inherent moisture of the coal.

Parting: A generally thin layer of rock, pyrite, or fusain in, or separating, benches of a coal seam.

Proximate analysis: The determination, by prescribed methods, of moisture, volatile matter, fixed carbon (by difference), and ash.

Rider coal: A thin coal seam above a minable seam.

Rootworked: An adjective applied to an ancient soil with evidence of roots or root action; commonly a clay.

Seam: A bed, vein, or series of beds of coal.

Seat earth: Rocks of any composition which have undergone weathering and/or the effects of the activities of plants (rootworking) during or shortly after their initial deposition.

Stigmaria: The subaerial portions of such Carboniferous plants as sigillarids and lepidodendrons. They are not technically considered roots; however, they are often referred to as such in the seat earths.

Sulfate (sulfur) bloom: A sulfate oxidation product of a sulfide occurring on exposed coal surfaces.

Underclay: Layer of claystone lying immediately beneath a coal bed. It usually shows signs of rootworking and often contains fossil roots or *Stigmaria.*

Ultimate analysis: The determination, in coal, of carbon, hydrogen, sulfur, nitrogen, and ash, and the estimation of oxygen by difference.

Vitrain: The well-defined bands of coal with brilliant vitreous luster and conchoidal fracture.

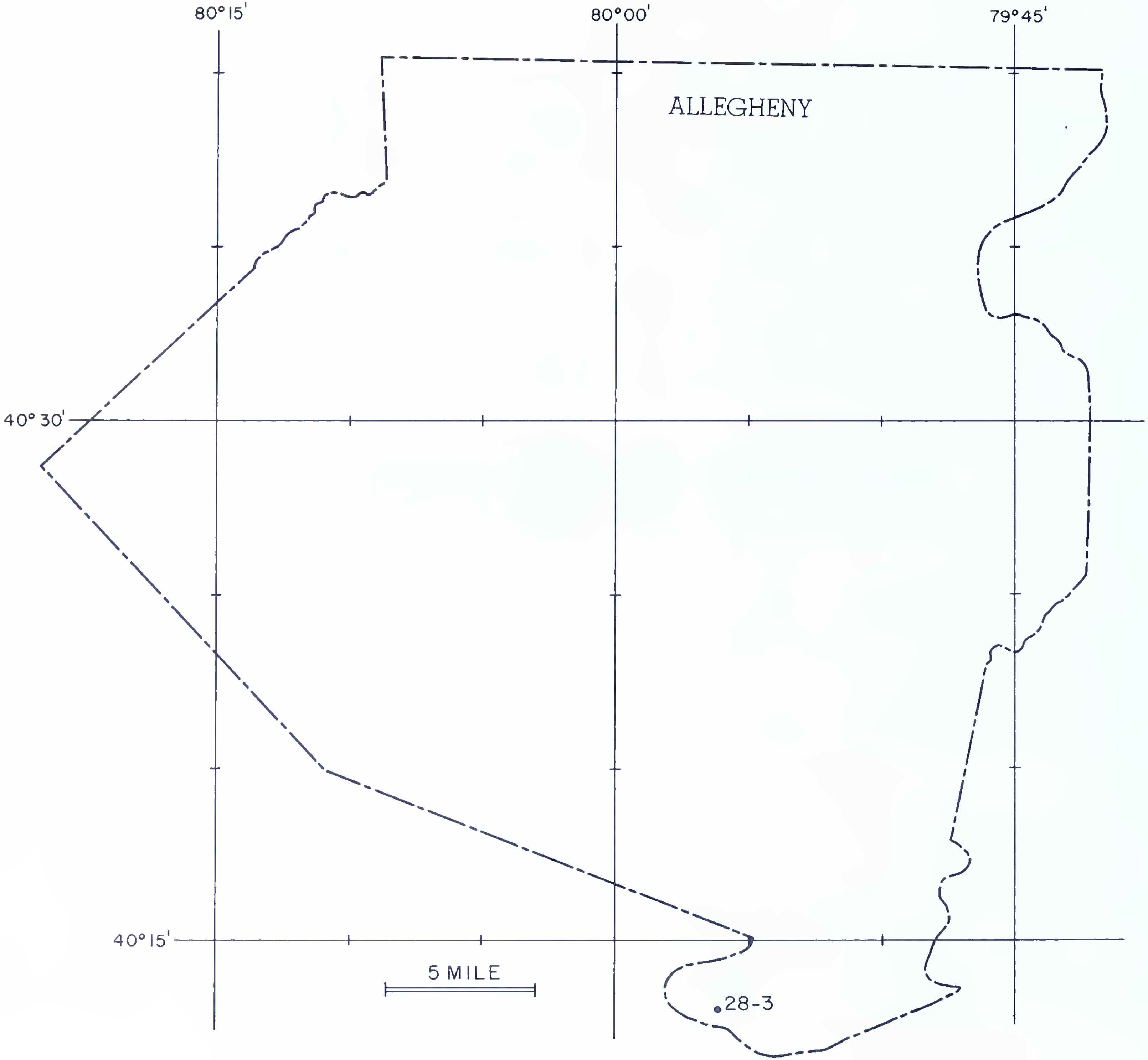
Volatile matter: Those products, exclusive of moisture, given off by a material as gas or vapor, determined by heating the coal sample under rigidly controlled conditions, measuring the weight loss, and correcting for moisture.

REFERENCES

American Society for Testing and Materials (1973), *Annual book of ASTM standards, 1973, Part 19, Gaseous fuels; coal and coke,* Philadelphia, Am. Soc. for Testing and Materials, 480 p.

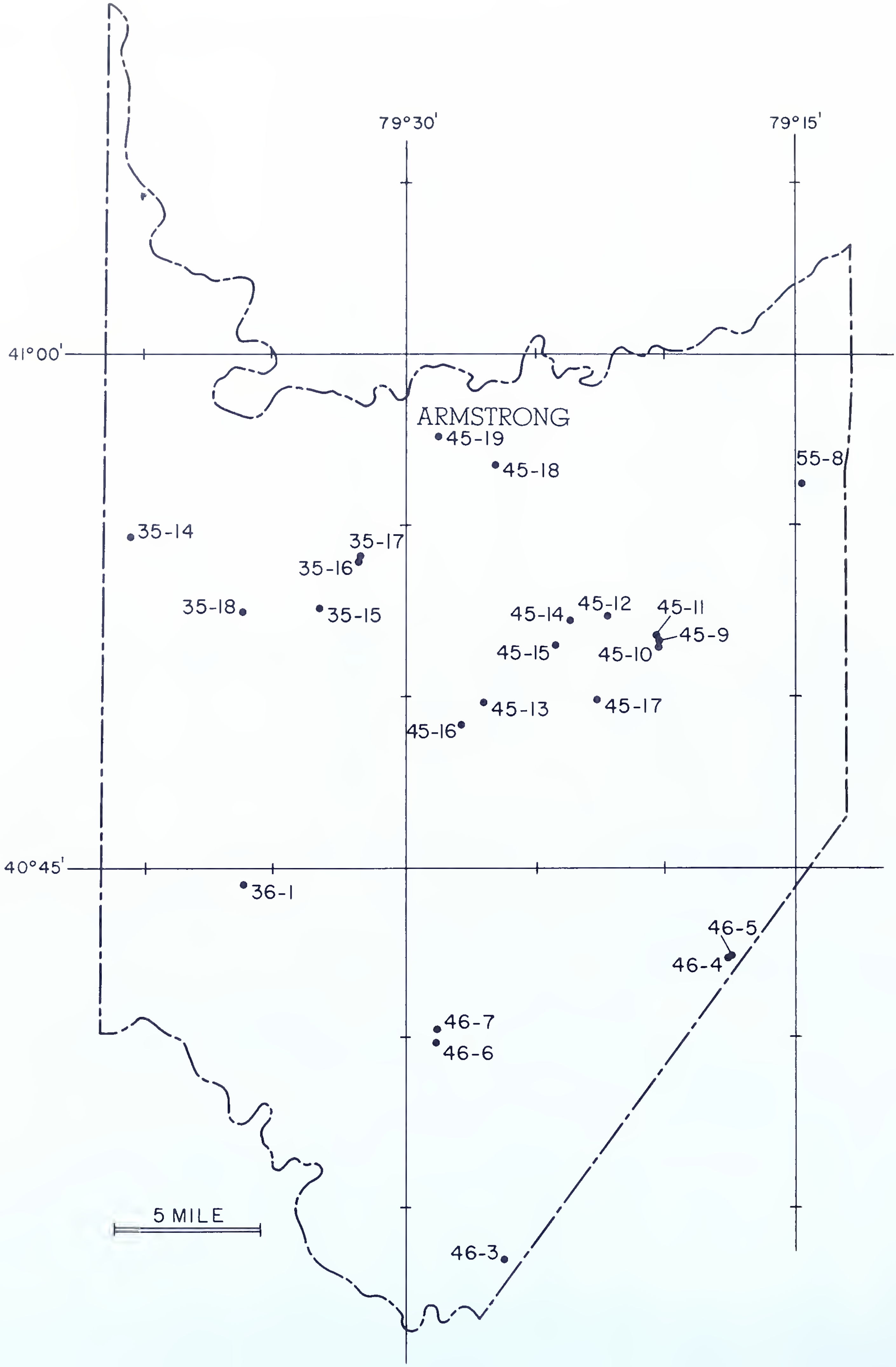
Sponseller, R. D. (1973), *Analyses and measured sections of Pennsylvania bituminous coals,* Pa. Geol. Survey, 4th ser., Min. Resource Rept. 66.

DATA SHEETS


80°15'
80°00'
79°45'
ALLEGHENY
40°30'
40°15'
5 MILE
28-3

SITE/STATION NO. 28-3	COUNTY: Allegheny		COAL SAMPLE NO(S).: 401301/795607/A
COMPANY: Consolidation Coal Co.	LAT. °N: 40°13'01"	ELEV. (base lower coal): Appx. 890'	401301/795607/B (duplicates)
MINE:	LONG. °W: 79°56'07"	TWP.: Forward	
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Brownsville	JOINTING:
SAMPLING METHOD: Drill core	DATE: 5-27-72	7 1/2' QUADRANGLE: Monongahela	
REPORTED COAL NAMES: Redstone			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.5	Underclay to clay shale			Md dk gy to gy bk																						Plant fossils.
3.2	Interbedded siltstone and claystone		S	Md gy to gy bk																						
4.5	Carbonaceous silty clay shale		G	Gy bk to bk																						
0.3	Shaly coal		G	Bk	B			x			x	x	MD													High fusain.
1.4	Carbonaceous silty claystone		G	Bk																						
2.2	Coal		G	Bk	B		x					x	M	1.7 1.5	34.2 33.9	54.9 55.2	9.2 9.4	5.0 5.1	74.4 74.6	1.6 1.6	8.1 7.6	1.7 1.6	13330 13310	8½ 9	2640 2740	Duplicate samples.
5.3	Calcareous claystone		S	Ol gy																						Limestone nodules.
5.5	Clayey limestone		G	Md gy, lt bn gy, lt ol gy, gn gy																						Thin claystone beds.
0.8	Calcareous claystone		G	Ol gy																						Limestone nodules.
1.8	Claystone		G	Dk gn gy to ol bk																						
5.2	Clay shale		G	Md dk gy																						


79°30'
79°15'
41°00'
40°45'
ARMSTRONG
45-19
45-18
55-8
35-14
35-17
35-16
35-18
35-15
45-14
45-12
45-11
45-9
45-15
45-10
45-13
45-17
45-16
36-1
46-5
46-4
46-7
46-6
5 MILE
46-3

SITE/STATION NO. 35-14	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405438/794043/1A, 405438/794043/1B
COMPANY: West Freedom Mining Corp.	LAT. °N: 40°54'38"	ELEV. (base lower coal):	
MINE: Geibel Strip	LONG. °W: 79°40'43"	TWP.: Sugar Creek	
PERMIT: 68-14	GEOLOGIST: ADG	15' QUADRANGLE: Kittanning	JOINTING: Sandstone - N32E
SAMPLING METHOD: Channel	DATE: 7-30-69	7 1/2' QUADRANGLE: Chicora	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
35.0	Sandstone			Lt gy & tan																						Cuts out underlying unit.
0-2.0	Clay shale		U	Md gy																						Few plant fragments and coaly streaks.
5.05	Coaly shale	1.1	S	Bk																						Profuse plant stems.
	Coal	2.2	S	Bk	B		x			x	x		M-MB	1.6	36.9	54.9	6.6	5.2	77.0	1.4	8.3	1.5	13740		2510	
	Black shale	0.25	S	Bk																						Coaly lenses.
	Coal	1.5	S	Bk	B			x			x	x	M-MD	1.6	33.7	49.7	15.0	4.8	69.6	1.4	7.5	1.7	12340		2550	Bony streaks.

SITE/STATION NO. 35-15
COMPANY: L. & E. Const. & Equip. Co.
MINE: Schoffner
PERMIT: 26-4
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Mahoning
COUNTY: Armstrong
LAT. °N: 40°52'31"
LONG. °W: 79°33'22"
GEOLOGIST: ADG
DATE: 7-30-69
ELEV. (base lower coal): Appx. 1220'
TWP.: S. Franklin
15' QUADRANGLE: Kittanning
7 1/2' QUADRANGLE: East Brady
COAL SAMPLE NO(S).: 405231/793322/2A, 405231/793322/2B
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
<12.0	Sandstone		S	Ol gn																						Soil cover. Abundant shale laminae.
1.0±	Coal		S	Bk																						Too weathered for sampling.
15.0	Claystone		G	Ol gy																						
8.0	Claystone		G	Md lt gy																						Slickensides.
10.0	Clay shale		G	Md lt gy																						Silty.
16.0	Silt shale		S	Dk gy																						Clayey. Invertebrate fossils.
5.7	Coal	1.1	S	Bk	B			x			x	x	M-MB	0.9	38.4	42.1	18.6	4.8	66.7	1.2	4.8	3.9	11980		2340	Thin pyrite lenses.
	Bone parting	0.4	S	Bk																						Tough.
	Coal	4.2	S	Bk	B		x				x		B-MB	1.0	41.1	51.7	6.2	5.2	77.6	1.4	7.2	2.4	13980		2440	Thin pyrite lenses.
0.1+	Claystone			Tannish gy																						Mine floor.

SITE/STATION NO. 35-16
COMPANY: Hawk Bros. Const. Co.
MINE: Roffner Strip
PERMIT: 121-5
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Armstrong
LAT. °N: 40°53'56"
LONG. °W: 79°31'58"
GEOLOGIST: ADG
DATE: 7-30-69

ELEV. (base lower coal): Appx. 1180'
TWP.: Washington
15' QUADRANGLE: Kittanning
7 1/2' QUADRANGLE: East Brady

COAL SAMPLE NO(S).: 405356/793158/2A, 405356/793158/2B
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
<24.0	Sandstone		U	Md lt gy																						Cuts out some of underlying unit.
6.0-16.0	Clay shale		S	Md dk gy																						Siderite nodules common. Marine fossils 6" above base.
3.1	Coal	0.85	S	Bk	B			x			x	x	M-MD	1.0	38.1	47.5	13.4	4.8	70.2	1.3	4.3	6.0	12810		2030	
	Coal	2.25	S	Bk	B	x					x		M-MB	1.2	38.3	49.9	10.6	5.0	72.6	1.3	4.8	5.7	13140		2090	
0.3+	Claystone			Tannish gy																						Mine floor.

SITE/STATION NO. 35-17	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405401/793150/2A
COMPANY: Hawk Bros. Const. Co.	LAT. °N: 40°54'01"	ELEV. (base lower coal): Appx. 1240'	
MINE: Roffner Strip	LONG. °W: 79°31'50"	TWP.: Washington	
PERMIT: 121-5	GEOLOGIST: ADG	15' QUADRANGLE: Kittanning	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-30-69	7 1/2' QUADRANGLE: East Brady	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Claroin-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.0+	Clay shale			Ol gy																						
			S																							
0.2	Clay			Lt gy																						Profuse plant material on top.
			S																							
5.5	Sandstone			Ol gy																						Very fine grained.
			G																							
36.0	Claystone			Dk gy																						Becomes md gy and ol gy at top. Abundant siderite nodules.
			S																							
2.5	Shaly coal	0.6		Bk																						
			S																							
	Coal	1.9		Bk	B			x			x	x	M-MD	1.2	39.4	50.9	8.5	5.2	75.2	1.3	5.9	3.9	13540		2080	
			S																							
0.1+	Claystone			Tannish gy																						Mine floor.

SITE/STATION NO. 35-18	COUNTY: Armstrong			COAL SAMPLE NO(S).: 405225/793623/2A, 405225/793623/2B, 405225/793623/2C	
COMPANY: E. W. Toy Coal Co.	LAT. °N: 40°52'25"	ELEV. (base lower coal): Appx. 1200'			
MINE: Minteer Strip	LONG. °W: 79°36'23"	TWP.: East Franklin			
PERMIT: 81-12	GEOLOGIST: WEE	15' QUADRANGLE: Kittanning		JOINTING: N22W, N5W, N20E	
SAMPLING METHOD: Channel	DATE: 8-19-69	7 1/2' QUADRANGLE: Kittanning			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Weathered	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25	Clay shale		G	Gy bk																						Siderite bands and nodules to 0.3'. Plant fossils.
0.3	Clay shale		S	Gy bk																						Pyrite oolites. Plant fossils. Invertebrate fossils.
3.4	Coal	1.2	S	Bk	B			x			x	x	B-MB	1.0	39.7	52.9	6.4	5.5	77.7	1.5	6.3	2.6	14080	7½	2130	Blocky.
	Pyrite and bone	0.1	S	Gy bk & yel gy	N								D													
	Coal	1.5	S	Bk	B		x				x	x	B-MB	1.1	39.6	50.4	8.9	5.3	74.5	1.4	4.8	5.1	13410	8	2130	Pyrite and fusain partings. Blocky.
	Coal	0.6	S	Bk	B			x			x	x	B-MB	1.1	34.6	46.1	18.2	4.6	65.0	1.2	3.5	7.5	11790	8½	2030	Pyrite and fusain partings.
-	Underclay																									Mine floor.

SITE/STATION NO. 36-1	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404433/793626
COMPANY: Nicholson Run Coal Co.	LAT. °N: 40°44'33"	ELEV. (base lower coal): Appx. 1100'	
MINE:	LONG. °W: 79°36'26"	TWP.: South Buffalo	
PERMIT: 586-1	GEOLOGIST: ADG	15' QUADRANGLE: Freeport	JOINTING: Sandstone - N06W-N10E, N85W-S85W
SAMPLING METHOD: Channel	DATE: 9-3-71	7 1/2' QUADRANGLE: Leechburg	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30.0+	Sandstone		U	Lt gy, lt ol gy																						Soil on top. Medium to fine grained. Crossbedding common. Cuts into siltstone slightly in places.
22.0	Siltstone		S	Md to md dk gy																						Few very thin sandstone laminae, very fine grained. Plant fragments rare.
2.9	Coal		S	Bk	B	x				x	x		M-MB	2.7	35.0	56.2	6.1	5.3	76.9	1.4	8.3	2.0	13730	8½	2140	Thin pyrite lenses common. Lower 0.4' tough, bony.
0.2+	Claystone			Md to md dk gy																						Stigmaria and slickensides present. Mine floor.

SITE/STATION NO. 45-9
COMPANY: Compass Coal Co.
MINE:
PERMIT: 33-6
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Kittanning
COUNTY: Armstrong
LAT. °N: 40°51'26"
LONG. °W: 79°20'16"
GEOLOGIST: ADG
DATE: 9-7-71
ELEV. (base lower coal): Appx. 1360'
TWP.: Wayne
15' QUADRANGLE: Rural Valley
7 1/2' QUADRANGLE: Rural Valley
COAL SAMPLE NO(S).: 405126/792016
JOINTING: Silt shale over coal - N2W, N88W
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0	Silt shale			Lt ol gy																						Soil developed on top.
11.0	Sandstone		S	Yls gy																						Fine to very fine grained. Locally cuts into unit below.
12.0	Silt shale		U	Md dk gy																						Plant leaves and fragments common.
1.9	Coal		S	Bk	B				x			x	M-MD	3.1	33.6	54.8	8.5	5.2	74.6	1.3	8.4	2.0	13290	8½	2340	
1.0+	Claystone		S	Lt to vy lt gy, lt bns gy																						Stigmaria and slickensides common. Mine floor.

SITE/STATION NO. 45-10	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405133/792017/2A, 405133/792017/2B
COMPANY: Compass Coal Co.	LAT. °N: 40°51'33"	ELEV. (base lower coal): Appx. 1300'	
MINE:	LONG. °W: 79°20'17"	TWP.: Wayne	
PERMIT: 33-6	GEOLOGIST: ADG	15' QUADRANGLE: Rural Valley	JOINTING: Clay shale - N5-9W, N68W, N48E
SAMPLING METHOD: Channel	DATE: 9-7-71	7 1/2' QUADRANGLE: Rural Valley	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS PROXIMATE (%)				ULTIMATE (%)								
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil cover																									
<3.0	Sandstone		S																							Weathered. Fine grained.
0.7+	Coal crop (Upper Kittanning)		S	Bk																						Too weathered for description or sampling.
<1.5	Claystone		G	Tan & gy																						Slightly plastic.
6.0	Silty clay shale		S	Lt ol gy																						Few very thin sandstone laminae, very fine grained.
5.0	Sandstone		G	Lt ol gy																						Very fine grained.
41.0	Clay shale		S	Md to md dk gy, lt ol gy																						Plant fragments common. Few very thin very fine grained sandstone laminae.
2.3	Coal	1.5	S	Bk	B			x				x	M-MD	2.6	35.2	57.3	4.9	5.4	79.9	1.4	7.1	1.3	14220	8½	2140	Slightly bony.
	Clay shale	0.1	S	Bk																						Carbonized plant stems. Thin coal lenses in upper part.
	Coal	0 7	S	Bk	B	x				x	x		MB-B	3.3	34.2	55.5	7.0	5.2	75.5	1.4	7.7	3.2	13510	8	2140	
0.1+	Claystone			Md to md dk gy																						Stigmaria and slickensides common. Mine floor.

SITE/STATION NO. 45-11
COMPANY: Compass Coal Co.
MINE:
PERMIT: 33-6
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Armstrong
LAT. °N: 40°51'38"
LONG. °W: 79°20'19"
GEOLOGIST: ADG
DATE: 9-7-71

ELEV. (base lower coal): Appx. 1260'
TWP.: Wayne
15' QUADRANGLE: Rural Valley
7 1/2' QUADRANGLE: Rural Valley

COAL SAMPLE NO(S).: 405138/792019/2A, 405138/792019/2B
JOINTING: Silt shale - N12W, N29E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil cover																									
2.0±	Coal			Bk																						Too weathered for description.
<1.0	Claystone		S	Md lt gy																						Too weathered for description.
32.0	Silt shale		G	Md dk gy																						Plant trash in upper part. Siderite nodules common in lower 3'.
2.7	Coal	1.1	S	Bk	B		x				x	x	M-MB	1.6	37.7	52.0	8.7	5.3	75.2	1.3	5.9	3.6	13640	8	2130	Clay partings common in upper 0.5'.
	Bone	0.1	S	Bk																						Parting. Tough.
	Coal	1.5	S	Bk	B	x					x		M-MB	2.8	38.0	52.1	7.1	5.4	76.3	1.4	6.0	3.8	13730	8	2080	Abundant pyrite in lower 0.5'.
0.3+	Claystone		S	Md to md dk gy																						Slickensides and _Stigmaria_ common. Underclay. Mine floor.

SITE/STATION NO. 45-12	COUNTY: Armstrong	COAL SAMPLE NO(S).: 405220/792214/1
COMPANY: Compass Coal Co.	LAT. °N: 40°52'20" ELEV. (base lower coal): 1580'±	
MINE:	LONG. °W: 79°22'14" TWP.: Boggs	
PERMIT: 33-9	GEOLOGIST: MAS 15' QUADRANGLE: Rural Valley	JOINTING: Coal - N65W(V), N55W(V), N40E(V),N82W(V),
SAMPLING METHOD: Channel face	DATE: 9-27-74 7 1/2' QUADRANGLE: Rural Valley	N5E(V), N15E(V)
REPORTED COAL NAMES: Upper Freeport		WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13	Sandstone			Lt ol gy																						Low-angle tabular crossbeds. Local channels.
0-0.5	Clay-silt laminite		U	Md gy to lt gy																						Silt lenses average 1 mm thickness.
0.2	Bone coal		S	Bk																						
3.9	Coal		G	Bk	B		x				x	x	B	6.9	32.4	56.2	4.5	5.3	72.8	1.4	15.3	0.7	12670	1½	2550	Weathered, close to outcrop.
0.1+	Claystone (underclay)		S	Lt bn to dk bn																						

SITE/STATION NO. 45-13	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404951/792704/1A, 404951/792704/1B
COMPANY: B H & H Coal Co.	LAT. °N: 40°49'51"	ELEV. (base lower coal): 1200'±	
MINE:	LONG. °W: 79°27'04"	TWP.: Valley	
PERMIT: 617-8	GEOLOGIST: MAS	15' QUADRANGLE: Rural Valley	JOINTING: N76W(75S), N5W(80E), N25E(75S), N80E(80S),
SAMPLING METHOD: Channel face	DATE: 9-27-74	7 1/2' QUADRANGLE: Mosgrove	N40E(70S); on coal - N60W(V), N20E(V)
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5+	Weathered zone																									Grades downward into underlying shale.
16	Silty clay shale		S	Lt ol gy																						
27.5	Sandstone		G	Md lt gy																						Abundant mica; shale beds up to 0.5' thick frequent.
1	Sand-silt laminite		G	Md gy																						Abundant plant fossils.
2.6-4	Claystone		S	Md gy																						Becomes silty upwards.
3.65	Bone coal	0.1	G	Bk																						
	Coal	0.46	G	Bk	B		x	x		x	x		M	2.0	36.9	56.0	5.1	5.3	78.9	1.3	6.8	2.6	14110	7½	2070	Shaly lenses up to 3 mm x 25 mm (rare).
	Shaly coal	0.1	G	Bk																						
	Coal	2.6	G	Bk	B	x				x	x		M	2.3	34.5	55.1	8.1	5.2	75.8	1.4	7.6	1.9	13550	8	2140	Pyrite lenses up to 1 cm x 20 cm (rare).
	Bone coal	0.17	G	Bk																						
	Coal	0.2		Bk																						

SITE/STATION NO. 45-14	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405210/79234B/1, 405210/79234B/2
COMPANY: Martin Coal Co.	LAT. °N: 40°52'10"	ELEV. (base lower coal): 1400'±	
MINE:	LONG. °W: 79°23'48"	TWP.: Boggs	
PERMIT: 419-6	GEOLOGIST: MAS	15' QUADRANGLE: Rural Valley	JOINTING:
SAMPLING METHOD: Channel face	DATE: 9-26-74	7 1/2' QUADRANGLE: Mosgrove	
REPORTED COAL NAMES: Upper and Lower Freeport			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13	Shale			Md dk gy																						Plant fossils common.
			S																							
1.9	Coal			Bk	B	x				x	x		MB	2.6	36.2	57.0	4.2	5.5	79.5	1.6	8.4	0.8	14190	B½	2680	
			S																							
1.6	Claystone (underclay)			Md dk gy																						Pods of black coaly shale present at base of bed. Rootworked.
			G																							
9.6	Sandstone			Md dk gy																						Plane bedded.
			S																							
4.8	Silt shale			Md dk gy																						
			G																							
0.2-0.7	Shale			Bk																						
			S																							
2.75-3.2	Coal			Bk	B		x				x	x	MB	2.5	32.B	52.3	12.4	5.0	71.1	1.3	7.8	2.4	12690	8	2560	Pyrite lenses up to 0.1' x 1' frequent.
			S																							
0.2	Shaly coal			Bk																						
			G																							
0.2+	Claystone (underclay)			Md gy																						

SITE/STATION NO. 45-15
COUNTY: Armstrong
COAL SAMPLE NO(S).: 405131/792417/1
COMPANY: Marklebullers Coal Co.
LAT. °N: 40°51'31"
ELEV. (base lower coal): 1060'±
MINE:
LONG. °W: 79°24'17"
TWP.: Boggs
PERMIT: 505-25
GEOLOGIST: MAS
15' QUADRANGLE: Rural Valley
JOINTING: N45E(V), N60W(V), N55E(65S), N30E(70S), N50E(80S)
SAMPLING METHOD: Channel face
DATE: 9-26-74
7 1/2' QUADRANGLE: Mosgrove
REPORTED COAL NAMES: Lower Freeport
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.5	Sand-silt laminite																									Plant fossils common. Sandstone beds 1 - 3 in. thick.
17.5	Shale		G	Lt ol gy																						Siderite nodules up to 0.2' - 0.8' abundant.
4	Shale		G	Dk gy bk																						
19	Clay shale		G	Md gy																						Abundant plant fossils.
2.8	Coal		S	Bk	B		x				x		D	1.6	36.7	53.2	8.5	5.2	76.2	1.4	7.2	1.5	13720	7½	2800	Pyrite nodules up to .3' in diameter present.
0.3+	Claystone (underclay)		S	Md bns gy																						

SITE/STATION NO. 45-16	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404904/792758/1		
COMPANY: B.H. & H. Coal Co.	LAT. °N: 40°49'04"	ELEV. (base lower coal): 1100'±			
MINE:	LONG. °W: 79°27'58"	TWP.: Rayburn			
PERMIT: 617-11	GEOLOGIST: MAS	15' QUADRANGLE: Rural Valley	JOINTING: N58E(80N), N10W(60W); on coal - N65W(V), N35E(V)		
SAMPLING METHOD: Channel face	DATE: 9-26-74	7 1/2' QUADRANGLE: Mosgrove			
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh		

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN							PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30±	Silt shale		G	Dk gy																						
0.25	Bone coal		S	Bk																						Coal streaks common.
3+	Coal			Bk	B	x				x	x		M	2.7	35.1	54.8	7.4	5.3	76.8	1.4	7.7	1.4	13620	8½	2300	Discontinuous shale layers up to 1 cm thick (rare). Pyrite frequent.

SITE/STATION NO. 45-17	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404947/792247/1
COMPANY: B.H. & H. Coal Co.	LAT. °N: 40°49'47"	ELEV. (base lower coal): 1360'±	
MINE:	LONG. °W: 79°22'47"	TWP.: Valley	
PERMIT: 617-7	GEOLOGIST: MAS	15' QUADRANGLE: Rural Valley	JOINTING: N61E(69S), N2W(72N), N45E(72N),
SAMPLING METHOD: Channel face	DATE: 9-26-74	7 1/2' QUADRANGLE: Mosgrove	N45E(80N), N50W(V)
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19	Silty sandstone		G	Md gy																						Plant fossils (rare).
14	Silt-clay laminite		S	Dk gy																						Plant fossils (rare).
2.4	Coal		S	Bk	B		x				x		M-D	2.1	34.0	52.4	11.5	5.0	73.0	1.2	5.9	3.4	13080	7½	2090	
1+	Claystone (underclay)			Md lt gy																						Rootlets and plant fossils common.

SITE/STATION NO. 45-18
COMPANY: Terry Reddinger
MINE:
PERMIT: 314-9
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning

COUNTY: Armstrong
LAT. °N: 40°56'42"
LONG. °W: 79°26'38"
GEOLOGIST: ADG
DATE: 9-9-71

ELEV. (base lower coal): Appx. 1400'
TWP.: Madison
15' QUADRANGLE: Rural Valley
7 1/2' QUADRANGLE: Templeton

COAL SAMPLE NO(S).: 405642/792638
JOINTING: Coal - N62W, N68W, N17E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil cover																									
0.4	Coal (Upper Kittanning?)			Bk																						Too weathered for description.
16.0	Claystone		S	Md to md lt gy, ol gy																						Rootworked. Upper 2' is underclay. Silty.
9.0	Sandstone	4.0	G	Lt gy																						Very fine grained.
	Siltstone	5.0	G	Md lt gy																						Mica on bedding planes.
14.0	Clay shale		G	Md to md dk gy																						Siderite nodules common.
1.3	Coal		S	Bk	B		x				x	x	M-MB	2.2	35.8	47.8	14.2	5.0	69.4	1.4	6.6	3.4	12570	7½	2140	
0.3+	Claystone		S	Lt bns gy																						Slickensides common. Rootlets common. Underclay. Mine floor.

SITE/STATION NO. 45-19	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405737/792855/1A, 405737/792855/1B
COMPANY: Huff Coal Co.	LAT. °N: 40°57'37"	ELEV. (base lower coal): Appx. 1400'	
MINE: O'Block	LONG. °W: 79°28'55"	TWP.: Madison	
PERMIT: 318-3	GEOLOGIST: ADG	15' QUADRANGLE: Rural Valley	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-23-69	7 1/2' QUADRANGLE: Templeton	
REPORTED COAL NAMES: Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Sandstone		S	Md lt gy																						Fine grained. Few thin clay-shale partings. Soil on top.
6.3+	Coal	3.7	S	Bk	B			x			x	x	M-MD	1.6	36.3	52.1	10.0	5.0	73.3	1.3	6.5	3.9	13100		2150	
	Clay-shale parting	0.5	S	Bk																						Thin coaly lenses.
	Coal	2.1+		Bk	B			x			x	x	M-MB	1.5	35.1	47.3	16.1	4.7	67.5	1.2	6.0	4.5	12120		2190	

SITE/STATION NO. 46-3
COMPANY: J. Merle Smith
MINE: White No. 1 Strip
PERMIT: 226-3
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Pittsburgh

COUNTY: Armstrong
LAT. °N: 40°33'36"
LONG. °W: 79°26'22"
GEOLOGIST: WEE
DATE: 8-1-69

ELEV. (base lower coal): Appx. 1200'
TWP.: Kiskiminetas
15' QUADRANGLE: Elders Ridge
7 1/2' QUADRANGLE: Avonmore

COAL SAMPLE NO(S).: 403336/792622/2A, -/2B, -/2C, -/2D
JOINTING: N50E, N50W
WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
17+	Sandstone		S	Lt gy																						Fine to medium grained.
8-10	Clay shale		G	Md gy																						Thickens north.
0.5-11	Clay shale with 0-7' sandstone		G	Md dk gy (sh) and lt gy (ss)																						Clay shale and sandstone thicken south. Sandstone is fine to medium grained. Plant fossils in shale. Coaly zones in shale.
1-7	Clay shale to silt shale		S	Md dk gy																						Thickens south. Siderite nodules.
9.5	Coal	2.45	S	Bk	B				x			x	MD -D	1.6	31.9	50.9	15.6	4.8	68.9	1.5	8.3	0.9	12170	6½	Above 2910	Blocky. Hard.
	Clay shale	0.1	S	Dk gy to md dk gy																						Plant fossils.
	Bone coal	0.7	S	Bk	N								MD -D	1.1	26.6	33.7	38.6	3.8	47.6	1.1	5.5	3.4	8570	2	2880	Pyrite. Blocky.
	Clay shale	0.2-0.3	S	Dk gy																						Plant fossils.
	Coal	1.25	S	Bk	N								M-MD	1.2	35.3	55.5	8.0	5.1	76.5	1.7	7.6	1.1	13760	8½	2730	Blocky.
	Clay shale	0.2	S	Dk gy to md dk gy																						Plant fossils.
	Coal	4.55	S	Bk	B		x					x	M-MB	1.5	30.9	54.8	12.8	4.9	72.1	1.5	7.4	1.3	12690	9	Above 2910	Blocky to crumbly.
–	Claystone			Md lt gy																						Mine floor.

SITE/STATION NO. 46-4
COMPANY: Apollo Coal Co.
MINE:
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES: Upper Freeport

COUNTY: Armstrong
LAT. °N: 40°42'18"
LONG. °W: 79°17'40"
GEOLOGIST: MAS
DATE: 10-1-74

ELEV. (base lower coal): 1070'±
TWP.: Plumcreek
15' QUADRANGLE: Elders Ridge
7 1/2' QUADRANGLE: Elderton

COAL SAMPLE NO(S).:
JOINTING: N50W(V), N40E(V)
WEATHERING: Fresh to weathered near top

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5	Sandstone		S	Lt ol gy																						Low-angle tabular crossbeds present.
2.1	Claystone		G	Lt gy to lt bn																						
3	Silt shale		G	Lt ol gy																						
9.5	Sandstone			Lt ol gy																						Light-gray shale beds up to 6" thick rare.
5	Covered																									
6	Silt shale		G	Md gy																						
3-6	Claystone (underclay)		G	Lt gy																						Limonite stained. Rootworked.
5	Shale			Md lt gy																						Plant fossils frequent.
17	Sandstone		G	Md lt gy																						Ripple crossbedded.
23	Shale		S	Dk gy																						Plant fossils abundant.
2.8	Coal			Bk	B		x				x	x	D-MD													Pyrite on joint surfaces.

SITE/STATION NO. 46-5	COUNTY: Armstrong	COAL SAMPLE NO(S).:
COMPANY: Apollo Coal Co.	LAT. °N: 40°42'26" ELEV. (base lower coal): 1150'±	
MINE:	LONG. °W: 79°17'36" TWP.: Plumcreek	
PERMIT:	GEOLOGIST: MAS 15' QUADRANGLE: Elders Ridge	JOINTING: Unit 2: N50W(V), N40E(V)
SAMPLING METHOD:	DATE: 10-1-74 7 1/2' QUADRANGLE: Elderton	
REPORTED COAL NAMES:		WEATHERING: Fresh to weathered near surface

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4	Soil		S																							
2	Limestone		S	Dk gy																						Biomicrite. Invertebrate fossils (brachiopod). Brush Creek Limestone.
1	Coaly shale		G	Bk																						
4.6	Sandstone		S	Lt gy to lt ol gy																						Low-angle tabular crossbeds present.
2	Shaly coal		G	Bk										4.9	29.3	50.3	15.5	4.5	63.2	1.3	14.6	0.9	10840	NC	2730	
3+	Claystone (underclay)			Md gy																						
	Backfill																									

SITE/STATION NO. 46-6	COUNTY: Armstrong		COAL SAMPLE NO(S).: 403957/792850/1
COMPANY: R & R Coal Co.	LAT. °N: 40°39'57"	ELEV. (base lower coal): 1160'±	
MINE:	LONG. °W: 79°28'50"	TWP.: Burrell	
PERMIT: 579-2(?)	GEOLOGIST: MAS	15' QUADRANGLE: Elders Ridge	JOINTING:
SAMPLING METHOD: Channel face	DATE: 10-1-74	7 1/2' QUADRANGLE: Whitesburg	
REPORTED COAL NAMES:			WEATHERING:

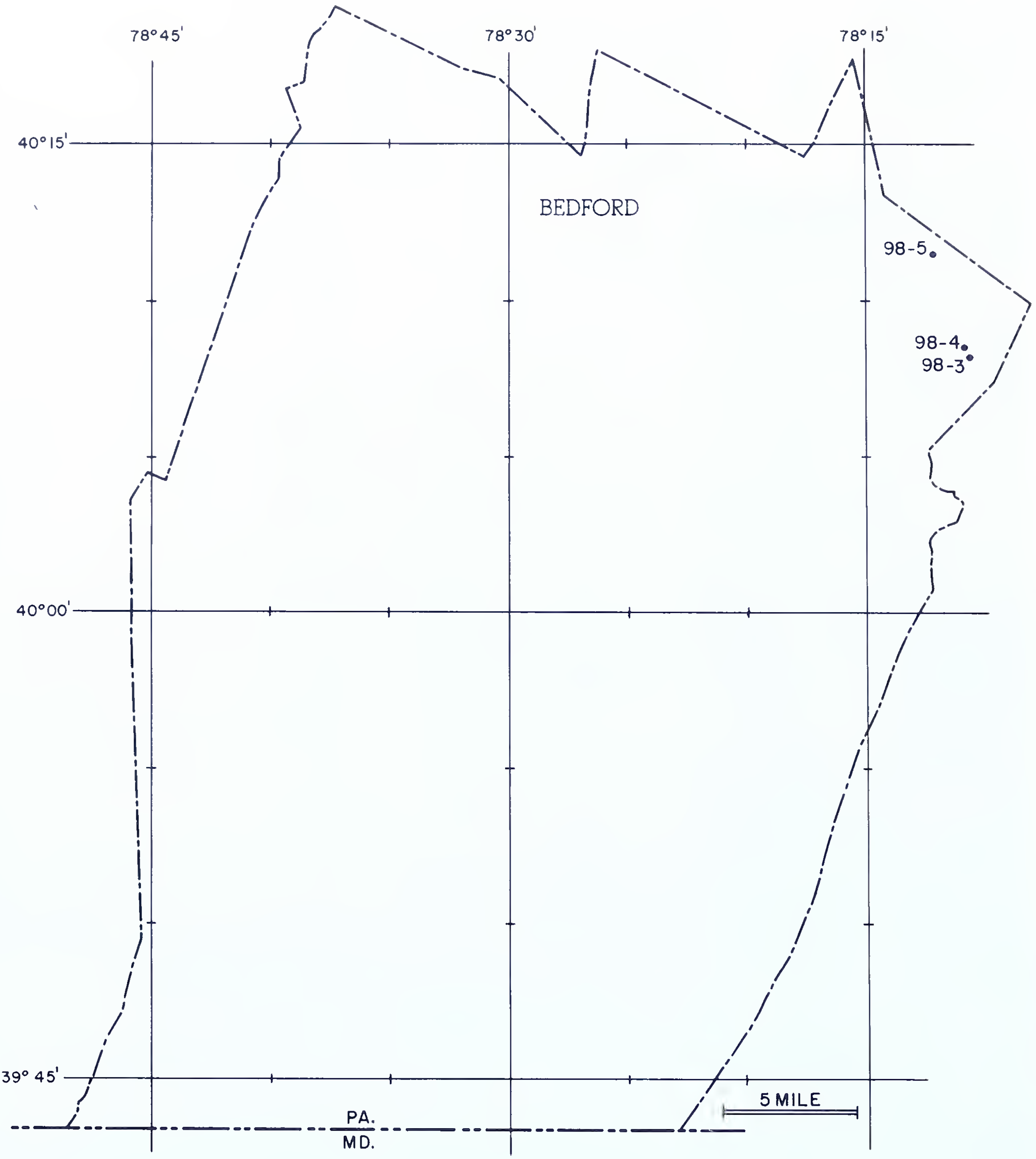
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15	Clay shale		G	Dk gy bk																						Plant fossils rare.
2-6	Silty claystone		G	Dk gy																						
12	Shale		G	Dk gy																						Siderite common near base.
11.5	Shale		S	Gy bk																						Plant fossils abundant.
2+	Coal			Bk	B	x				x	x		B	1.6	36.7	54.7	7.0	5.3	76.5	1.3	5.9	4.0	13950	7½	2130	Base not exposed (under water).

SITE/STATION NO. 46-7	COUNTY: Armstrong		COAL SAMPLE NO(S).: 404012/792853/1
COMPANY: Fiore Devel. Corp.	LAT. °N: 40°40'16"	ELEV. (base lower coal): 1070'±	
MINE:	LONG. °W: 79°28'56"	TWP.: Burrell	
PERMIT: 305-8	GEOLOGIST: MAS	15' QUADRANGLE: Elders Ridge	JOINTING: N-S(80W), N80E(80N), N20W(V), N35E(V)
SAMPLING METHOD: Channel face	DATE: 10-2-74	7 1/2' QUADRANGLE: Whitesburg	
REPORTED COAL NAMES: Mahoning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3-4	Shale		S	Dk gy bk																						
11	Shale		G	Dk bns gy																						
2.5	Shale		S	Gn gy																						Siderite nodules common.
42	Shale		S	Dk gy bk																						Pyrite lenses 0.1 - 0.5' rare in lower 10'.
2.75	Coal			Bk	B	x					x	x	MB -B	1.8	49.7	40.8	7.7	5.4	75.4	1.4	5.4	4.7	13800	8	2180	Pyrite present in thin layers parallel to bedding.

SITE/STATION NO. 55-8	COUNTY: Armstrong		COAL SAMPLE NO(S).: 405609/791453
COMPANY: Markle-Buller Coal Co.	LAT. °N: 40°56'09"	ELEV. (base lower coal): Appx. 1360'	
MINE:	LONG. °W: 79°14'53"	TWP.: Redbank	
PERMIT: 504-15	GEOLOGIST: ADG	15' QUADRANGLE: Smicksburg	JOINTING: Coal - N72W; clay shale - N22E, N38E
SAMPLING METHOD: Channel	DATE: 9-8-71	7 1/2' QUADRANGLE: Dayton	
REPORTED COAL NAMES: Lower Kittanning, Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Sandstone																									Note: Highwall inaccessible above clay shale unit. Thin bedded.
4.0	Silt shale		G																							
1.6	Coal		S	Bk																						Inaccessible.
4.0	Claystone		S	Tan gy																						Underclay.
9.0	Sandstone		G	Lt ol gy																						Very fine grained.
27.0	Clay shale		S	Gy bk																						Marine fossils common about 3' above base. Siderite nodules abundant in lower 5'.
2.8	Coal		S	Bk	B		x			x	x		M-MB	1.9	37.4	54.1	6.6	5.4	77.6	1.4	6.3	2.7	13980	8½	2240	Top part bony, tough.
0.2+	Claystone		S	Md lt to lt gy																						*Stigmaria* and slickensides common. Mine floor.


78°45'
78°30'
78°15'
40°15'
40°00'
39° 45'
BEDFORD
98-5
98-4
98-3
5 MILE
PA.
MD.

SITE/STATION NO. 98-3

COUNTY: Bedford

COAL SAMPLE NO(S).: 400811/781039/2A and 400811/781039/2B

COMPANY:

LAT. °N: 40°08'11"

ELEV. (base lower coal): Appx. 2100'

MINE: Abandoned strip and deep mine

LONG. °W: 78°10'39"

TWP.: Broad Top

PERMIT:

GEOLOGIST: WEE

15' QUADRANGLE: Broad Top

JOINTING: Silt shales: N47W, N31E; strip mine floor (carb. clay shale): N55W, N78E; coal: N2E (dip 64SE)

SAMPLING METHOD: Channel

DATE: 10-1-70

7 1/2' QUADRANGLE: Saxton

REPORTED COAL NAMES: Barnett Coal, Twin Coal (Strike N83E, dip 5NW)

WEATHERING: Weathered

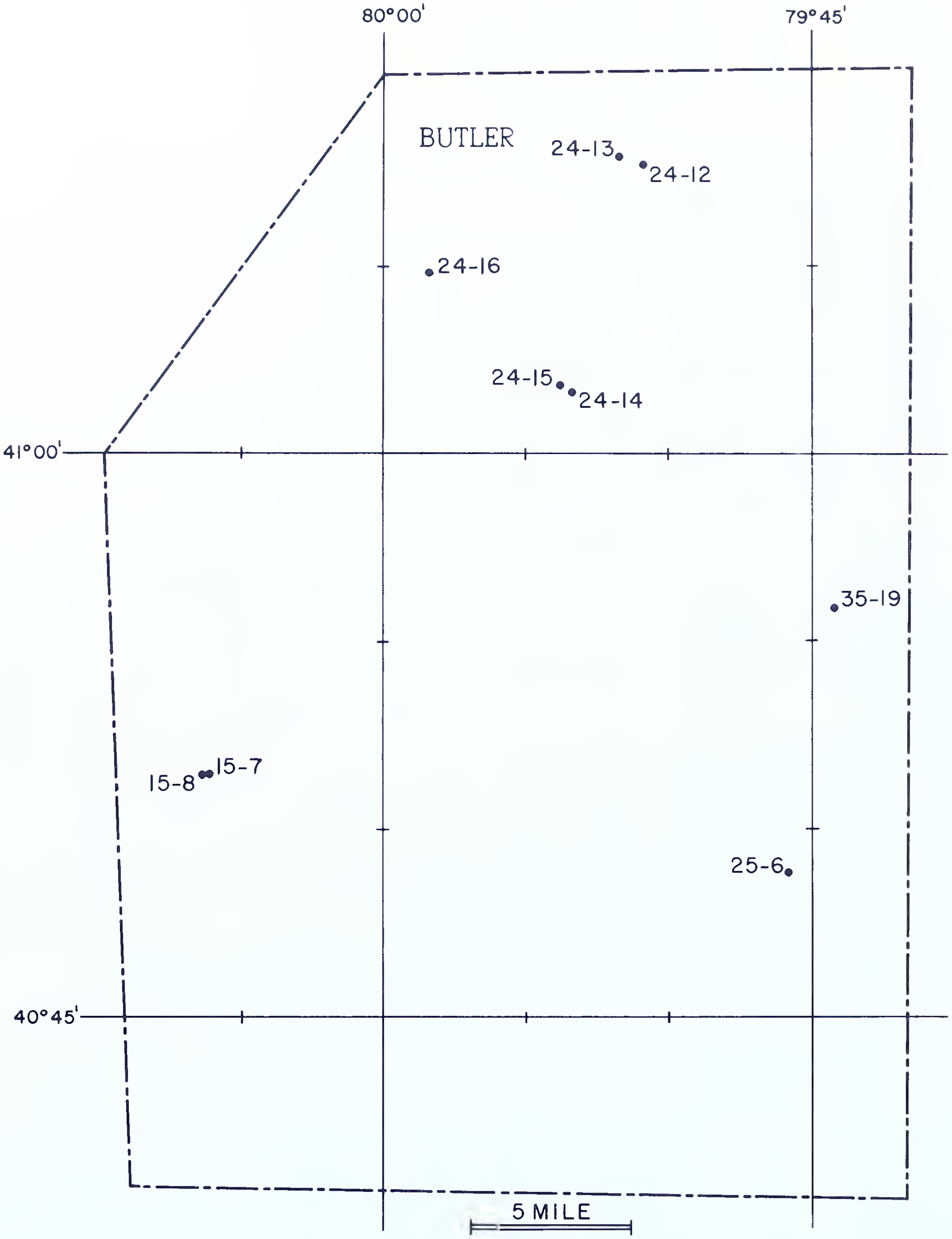
STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	COAL VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	COAL VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod.-dull, dull)	COAL ANALYSIS PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
35+	Sandy, carbonaceous silt shale			Gy bk to dk gy																						Siderite nodules. Plant fossils.
			G																							
2.4	Silt shale			Dk gy to gy bk																						Micaceous.
			G																							
0.8	Carbonaceous claystone			Gy bk																						
			S																							
2.1	Coal			Bk	B		X					X	M	1.3	15.4	75.3	8.1	4.1	81.9	1.3	3.6	1.0	14100	4	Above 2910	Twin coal. Friable. Splintery. High fusain. Many thin shale partings.
			S																							
0.4	Coaly clay shale			Bk																						Plant fossils.
			S																							
2.5	Interbedded sandstone and sandy silt shale			Md gy and dk gy																						Plant fossils.
			S																							
0.2	Bone coal			Gy bk	N								D													Hard.
			G																							
3.1	Coal			Bk	B		X					X	M	1.7	15.2	74.8	8.3	4.3	80.8	1.3	3.6	1.7	13920	8	Above 2910	Barnett coal. Few partings.
			S																							
0.3+	Clay shale			Bk																						Mine floor. Carbonaceous. White sulfate blossom.

SITE/STATION NO. 98-4	COUNTY: Bedford		COAL SAMPLE NO(S).: 400827/781050/1
COMPANY: Sam Barton Coal Co.	LAT. °N: 40°08'27"	ELEV. (base lower coal): Appx. 2160'	
MINE: Figard No. 3	LONG. °W: 78°10'50"	TWP.: Broad Top	
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Broad Top	JOINTING: Clay shales: N52W, N37E
SAMPLING METHOD: Channel	DATE: 10-1-72	7 1/2' QUADRANGLE: Saxton	Sandstone: N57W, N29W, N47E
REPORTED COAL NAMES: Kelly			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Cloroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
38+	Interbedded sandy silt shale and sandstone		U	Dk gy to vy lt gy																						Plant fossils. Basal shale-chip and quartz-pebble conglomerate.
3.0	Clay shale		G	Md lt gy																						Lumpy, irregular bedding.
6.5	Clayey silt shale		G	Md gy																						Siderite nodules.
9.5	Silty clay shale		G	Ol gy to dk gy																						Siderite lenses and zones.
1.5	Clay shale		S	Ol gy																						Plant fossils.
4.0	Coal		S	Bk	B		X					X	M	0.6	14.8	67.7	16.9	3.8	72.6	1.3	2.4	3.0	12640	7	2780	Many thin shale and fusain partings.
1.4	Clay shale and fusain		G	Bk																						
1.5	Interbedded coal and bone coal			Bk	M		X					X	M-MD													Not mined. Tough. Hard.

SITE/STATION NO. 98-5	COUNTY: Bedford		COAL SAMPLE NO(S).: 401134/781212/2
COMPANY: C. E. Clark	LAT. °N: 40°11'34"	ELEV. (base lower coal): Appx. 1520'	
MINE: Clarks No. 2	LONG. °W: 78°12'12"	TWP.: Broad Top	
PERMIT: 272-1	GEOLOGIST: WEE	15' QUADRANGLE: Broad Top	JOINTING: N30E, N60W
SAMPLING METHOD: Channel	DATE: 8-8-69	7 1/2' QUADRANGLE: Saxton	
REPORTED COAL NAMES: Reported as Pittsburgh, probably Rogers			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16+	Sandstone			Vy lt gy																						Fine grained. Very clayey.
0-9	Claystone		S	Md dk gy																						Cuts out clay shale below. Large lens. Soft, friable.
1 to 10	Clay shale		U	Dk gy																						Replaced by claystone above.
1.6	Siltstone		S	Dk gy																						Sandy. Carbonaceous. Plant fossils.
0.7	Bone coal		G	Bk	N								D													
0.5	Bone coal		S	Bk	N								MD -D													
2.75	Coal		S	Bk	B			X			X	X	M-MD	0.7	17.9	66.3	15.1	4.2	74.8	1.6	3.6	0.7	12930	9	Above 2910	
0.2	Bone coal		S	Gy bk	B				X			X	D													
0.2+	Underclay		S	Md gy																						Mine floor. Plastic.


80°00'
79°45'
BUTLER
24-13
24-12
24-16
24-15
24-14
41°00'
35-19
15-8
15-7
25-6
40°45'
5 MILE

SITE/STATION NO. 15-7
COMPANY: Kerry Coal Co.
MINE:
PERMIT: 41-21
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport

COUNTY: Butler
LAT. °N: 40°51'34"
LONG. °W: 80°06'05"
GEOLOGIST: ADG
DATE: 8-31-71

ELEV. (base lower coal): Appx. 1080'
TWP.: Lancaster
15' QUADRANGLE: Zelienople
7 1/2' QUADRANGLE: Evans City

COAL SAMPLE NO(S).: 405134/800605/2A
JOINTING: Clay shale: N60W, N14E, N42E
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0	Silt shale		G	Yl gy																						Soil cover.
15.0	Clay shale		S	Md dk gy to bk, lt ol gy																						Invertebrate fossils (conchostracans) present about 3 ft above base of unit. Color becomes lighter upward.
2.0	Bone	0.2	S	Bk	B			X	X			X	M-MD													Tough.
	Coal	1.8	S	Bk	B	X				X	X		M-MB	3.4	36.7	53.8	6.1	5.3	75.4	1.4	9.3	2.5	13460	8	2010	Few thin pyrite lenses.
	Claystone			Ol gy																						Stigmaria and slickensides present. Becomes medium gray toward top. Mine floor.

SITE/STATION NO.: 15-8
COMPANY: Kerry Coal Co.
MINE:
PERMIT: 41-25
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning

COUNTY: Butler
LAT. °N: 40°51'37"
LONG. °W: 80°06'15"
GEOLOGIST: ADG
DATE: 8-31-71

ELEV. (base lower coal): Appx. 980'
TWP.: Lancaster
15' QUADRANGLE: Zelienople
7 1/2' QUADRANGLE: Evans City

COAL SAMPLE NO(S).: 405137/800615/2A, 405137/800615/2B
JOINTING: Coal: N78W; clay shale: N40W, N52W
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0	Silt shale			Lt gys ol																						Soil cover on top.
24.0	Silty clay shale		G	Md dk gy																						Few plant fragments. Few very thin sandstone laminae toward top. Rare siderite nodules.
2.3	Bony coal	0.8	S	Bk	B				X			X	M-MD	1.4	37.2	46.1	15.3	4.9	68.6	1.3	6.3	3.6	12460	7	2090	Tough, hard. Pyrite lenses present.
	Coal	1.5	S	Bk	B	X					X		M-MB	1.8	39.0	49.0	10.2	5.2	72.3	1.4	7.1	3.8	12990	7½	2090	
0.3+	Claystone		S	Bns bk, md dk gy																						*Stigmaria* and slickensides common. Color becomes lighter downward. Mine floor.

SITE/STATION NO. 24-12	COUNTY: Butler		COAL SAMPLE NO(S).: 410740/795052
COMPANY: Western Hickory Coal Co., Inc.	LAT. °N: 41°07'40"	ELEV. (base lower coal): Appx. 1280'	
MINE:	LONG. °W: 79°50'52"	TWP.: Venango	
PERMIT: 152-9	GEOLOGIST: ADG	15' QUADRANGLE: Hilliards	JOINTING: Coal: N63W, N22E, N42E
SAMPLING METHOD: Channel	DATE: 9-2-71	7 1/2' QUADRANGLE: Eau Claire	
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Silt shale		G	Md gy																						Soil on top.
2.0	Siltstone		S	Lt ol bn																						
11.0	Silt shale		S	Lt ol gy																						Clayey in lower 4 ft.
4.5	Limestone (Vanport)		U	Md to md lt gy																						Marine fossils common.
<0.2	Clay shale		S	Dk gy																						Silty, carbonaceous.
2.0	Coal		S	Bk																						Too weathered for description or sampling.
6.0	Claystone		G	Lt bns gy, lt ol gy																						*Stigmaria* common.
3.0	Silt shale		G	Lt ol gy																						
16.0	Sandstone		S	Lt bls gy																						Medium grained. Some crossbedding. Carbonaceous material common.
3.4	Coal (Brookville)		S	Bk	B				X			X	M-MD	2.8	40.5	48.5	8.2	5.4	73.3	1.3	7.5	4.3	13260	7½	2190	
0.3+	Claystone			Lt bns gy, md gy																						Plant rootlets and slickensides common. Mine floor.

SITE/STATION NO. 24-13
COMPANY: Tiche Limestone and Construction Co.
MINE:
PERMIT: 207-1
SAMPLING METHOD: Face channel
REPORTED COAL NAMES: Middle Kittanning (C)
COUNTY: Butler
LAT. °N: 41°07'56"
LONG. °W: 79°51'40"
GEOLOGIST: JDI-VWS
DATE: 8-23-74
ELEV. (base lower coal): 1420'±
TWP.: Venango
15' QUADRANGLE: Hilliards
7 1/2' QUADRANGLE: Eau Claire
COAL SAMPLE NO(S).: 410756/795140/2
JOINTING: Coal: N74W, N59W (face); N39E (butt)
WEATHERING: Fresh to moderately weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Sand-silt laminite shale		G	Md dk gy to lt gy																						Grades laterally into sandstone.
4.5	Sandstone		S	Lt gy																						Festoon crossbedding. Fine grained; thin silt laminae throughout.
1.0	Sand-silt laminite shale		G	Md dk gy to lt gy																						Discontinuous laterally.
5.0	Sandstone		U	Lt gy																						Basal conglomerate with abundant plant fragments. Fine grained; thin silt laminae throughout.
3.0	Silt-clay laminite shale		G	Md dk gy																						Siderite nodules common, some mineralized (sphalerite).
3.9	Coal		S	Bk	N									1.7	44.0	45.8	8.5	5.9	75.8	1.6	7.0	1.2	13870	4½	2630	Cannel. Upper 0.4' bony, pyritic.
3.2+	Claystone (underclay)			Md dk gy																						Plastic; rootlets common.

SITE/STATION NO. 24-14	COUNTY: Butler			COAL SAMPLE NO(S).: 410138/795327	
COMPANY: Sunbeam Coal Co.	LAT. °N: 41°01'38"	ELEV. (base lower coal): Appx. 1410'			
MINE: Rider Strip	LONG. °W: 79°53'27"	TWP.: Clay			
PERMIT: 179-7	GEOLOGIST: ADG	15' QUADRANGLE: Hilliards		JOINTING:	
SAMPLING METHOD: Channel	DATE: 7-29-69	7 1/2' QUADRANGLE: West Sunbury			
REPORTED COAL NAMES: Lower Freeport				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18.0+	Clay shale		S	Md dk gy																						Silty; compaction slickensides.
1.8	Coal		S	Bk	B		X				X		B-MB	2.1	35.8	58.3	3.8	5.2	79.2	1.6	9.1	1.1	14010		2690	
0.1+	Claystone			Md dk gy																						Mine floor.

SITE/STATION NO. 24-15	COUNTY: Butler			COAL SAMPLE NO(S).: 410147/795346/1A,	
COMPANY: Sunbeam Coal Co.	LAT. °N: 41°01'47"	ELEV. (base lower coal): Appx. 1280'		410147/795346/1B	
MINE: Rider Strip	LONG. °W: 79°53'46"	TWP.: Cherry			
PERMIT: 179-7	GEOLOGIST: ADG	15' QUADRANGLE: Hilliards		JOINTING:	
SAMPLING METHOD: Channel	DATE: 7-29-69	7 1/2' QUADRANGLE: West Sunbury			
REPORTED COAL NAMES: Middle Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA — COAL ANALYSIS

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Clay shale		G	Md gy																						Soil cover.
1.3	Silt shale		G	Dk gy to bk																						Marine fossils.
0.4	Siltstone		S	Dk gy																						
0.3	Coaly shale		S	Bk																						
16.0	Clay shale		S	Dk gy																						Few sandstone interbeds near top.
2.8+	Coal	0.85	S	Bk	B			X			X	X	M-MD	1.6	38.4	53.9	6.1	5.5	78.1	1.6	7.7	1.0	13870		2690	
	Coal	0.15	S	Bk																						Bony.
	Coal	1.8+		Bk	B		X				X		B-MB	1.6	38.9	49.3	10.2	5.1	73.1	1.4	6.5	3.7	13130		2090	Water at base of coal.

SITE/STATION NO. 24-16	COUNTY: Butler		COAL SAMPLE NO(S).: 410451/795822/2A, 410451/795822/2B
COMPANY: Grove City Limestone Co.	LAT. °N: 41°04'51"	ELEV. (base lower coal): 1240'	
MINE: Bovard Strip	LONG. °W: 79°58 22"	TWP.: Cherry	
PERMIT: 483-2	GEOLOGIST: ADG	15' QUADRANGLE: Hilliards	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-29-69	7 1/2' QUADRANGLE: West Sunbury	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0+	Sandstone			Lt gy																						Channel cuts out unit below in places.
0-8.0	Clay shale		U	Md gy																						Siderite nodules common.
2.55	Coal	1.45	S	Bk	B			X			X	X	D-MD	1.7	37.3	48.3	12.7	5.0	70.8	1.4	8.1	2.0	12670		2570	Tough, bony.
	Coal	1.1	S	Bk	B		X				X	X	M-MB	1.8	38.0	52.9	7.3	5.2	75.6	1.4	8.3	2.2	13550		2190	
0.4+	Claystone		S	Tan gy																						Mine floor.

SITE/STATION NO. 25-6	COUNTY: Butler		COAL SAMPLE NO(S).: 404850/794551/2
COMPANY: West Freedom Mining Co.	LAT. °N: 40°48'50"	ELEV. (base lower coal): 1110±	
MINE:	LONG. °W: 79°45'51"	TWP.: Winfield	
PERMIT: 68-27	GEOLOGIST: VWS-JDI	15' QUADRANGLE: Butler	JOINTING: Coal: N68W (face); N45E (butt)
SAMPLING METHOD: Face channel	DATE: 8-27-74	7 1/2' QUADRANGLE: Saxonburg	
REPORTED COAL NAMES: Upper Freeport (E)			WEATHERING: Fresh to moderately weathered

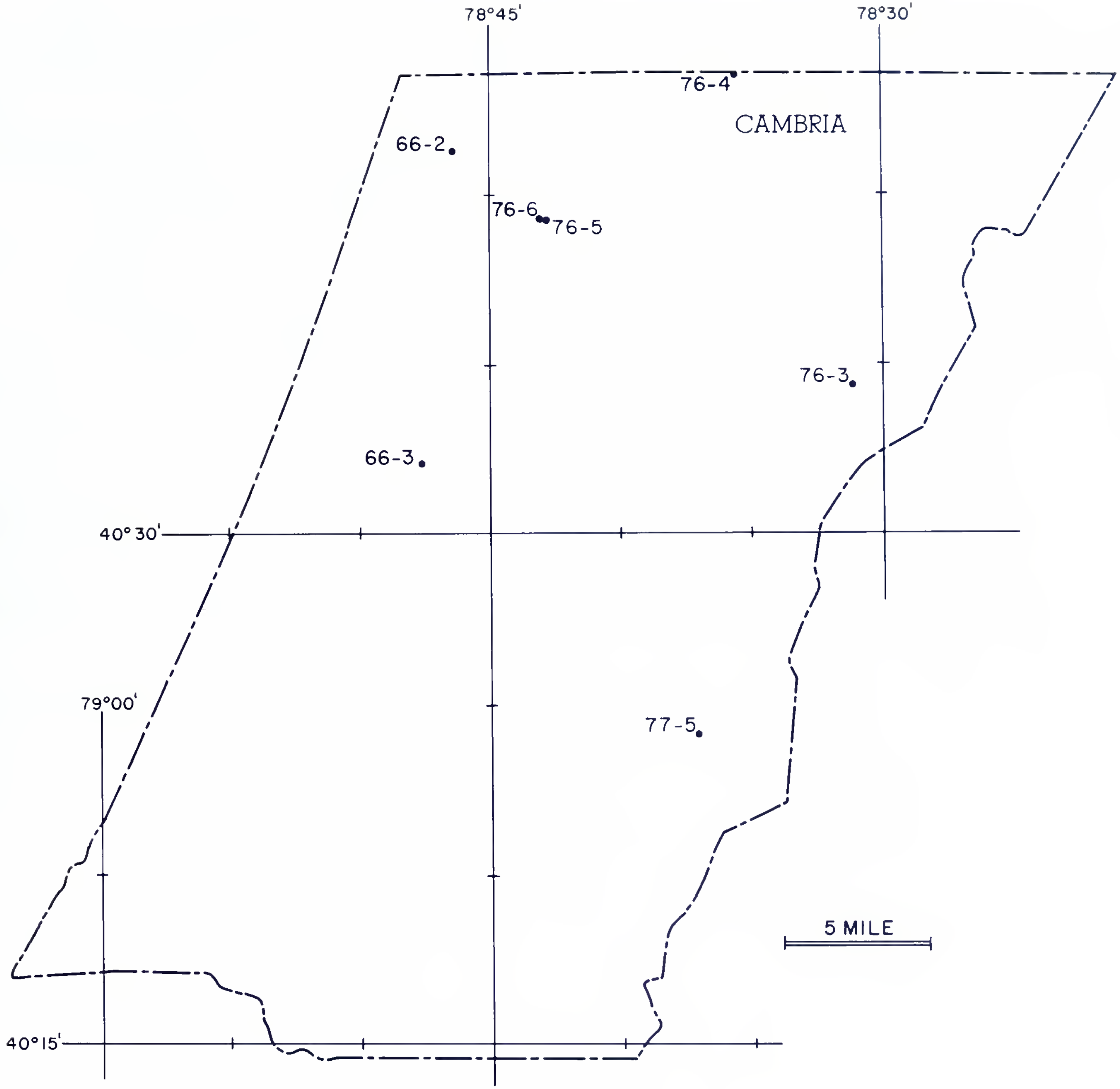
STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sand-silt laminite and sandstone, interbedded																									
12.0	Sandstone		G	Vy lt gy																						Planar bedded; fine to medium grained.
8.0	Sand-silt laminite shale		U	Md gy																						
1.0	Silt shale		G	Md gy																						Plant fossils present (_Pecoptens_ abundant, _Neuropteris_ and _Asterophyllites_ frequent, _Cyclopteris_ rare).
0.8	Bony coal		S	Bk	B			X	X		X	X	D													Sulfurous; less vitrain toward top.
0.5	Carbonaceous clay shale			Bk to dk gy																						Parting.
3.0	Coal			Bk	B		X				X	X	MB-B	2.7	38.8	54.9	3.6	5.6	79.1	1.5	8.8	1.4	14170	7½	2180	Hard; somewhat sulfurous.
	Claystone (underclay)		S	Lt gy																						Plastic; rootlets common.

SITE/STATION NO. 35-19 (page 1)	COUNTY: Butler		COAL SAMPLE NO(S).: 405551/794408/2A, 405551/794408/2B, 405551/794408/2C
COMPANY: B and G Construction Co.	LAT. °N: 40°55'51"	ELEV. (base lower coal): 1250'±	
MINE:	LONG. °W: 79°44'08"	TWP.: Donegal	
PERMIT: 259	GEOLOGIST: JDI-VWS	15' QUADRANGLE: Kittanning	JOINTING: Coal: N60W (face)
SAMPLING METHOD: Face channel	DATE: 8-27-74	7 1/2' QUADRANGLE: Chicora	
REPORTED COAL NAMES: Upper Freeport (E)			WEATHERING: Fresh to moderately weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0+	Sandstone		U																							Mostly planar bedded, with some channel cut-and-fills.
10.0	Silt-clay laminite shale		G	Md gy																						
2.0-8.0	Conglomerate		G	Lt gy to bn gy																						Plant stems abundant (Calamites, etc.), replaced by siderite.
2.0-8.0	Sandstone		U	Lt gy																						Plant fragments abundant.
12.0	Claystone (underclay)		G	Lt gy																						Freshwater limestone nodules abundant. Rootlets common.
8.0	Siltstone		G	Lt ol gy																						Sandy. Plant fragments frequent.
30.0	Silt-clay laminite shale		G	Md dk gy																						Siderite common in lower part. Plant stems abundant. Plant fossils (Neuropteris common) present.
1.5	Silty clay shale		S	Dk gy to md dk gy																						Plant stems abundant.
	Coal	0.4		Bk	B				X			X	D													
	Bone	0.8		Bk to gy bk																						Pyrite abundant.
5.3	Coal	2.0		Bk	B	X	X				X	X	D	2.9	34.9	53.4	8.8	5.2	74.3	1.4	9.5	0.8	13210	6½	2910+	Hard. Pyritic.

SITE/STATION NO. 35-19 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal	0.5		Bk	B	X				X	X	X	MD-D	3.4	29.4	50.2	17.0	4.7	65.8	1.2	10.5	0.8	11650	5½	2910+	Soft, with a few thin shaly laminations. Plant trunk compactions abundant.
	Coal and clay shale, interbedded	0.7		Bk to gy bk																						
	Coal	0.9		Bk	B	X	X			X	X	X	MD-D	2.7	32.1	50.1	15.1	4.8	68.2	1.3	9.5	1.1	12150	6½	2910+	
	Claystone (underclay)		S	Md dk gy																						Plastic. Slickensides. Rootlets common.


78°45'
78°30'
76-4
CAMBRIA
66-2
76-6
76-5
76-3
66-3
40°30'
79°00'
77-5
5 MILE
40°15'

SITE/STATION NO. 66-2
COMPANY: Hepburnia Coal Co.
MINE: Garman & Emigh Run
PERMIT: 14-13
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport
COUNTY: Cambria
LAT. °N: 40°41'12"
LONG. °W: 78°46'36"
GEOLOGIST: GBG
DATE: 8-12-69
ELEV. (base lower coal): Appx. 1570'
TWP.: Susquehanna
15' QUADRANGLE: Barnesboro
7 1/2' QUADRANGLE: Barnesboro
COAL SAMPLE NO(S).: 404112/784636/2A, 404112/784636/2B, 404112/784636/2C
JOINTING: Coal: N82W, N10E, N90W, N5E
Sandstone: N28W, N58E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13.0+	Interbedded siltstone and claystone		G	Gn gy																						Irregularly bedded.
19.5	Interbedded sandstone and siltstone		G	Gn gy																						Irregularly bedded.
10.0	Sandstone		U	Md lt gy																						Crossbedded.
4.5	Coal	0.5	G	Bk	B			X			X	X	MD -D	0.8	19.2	34.7	45.3	3.0	43.9	0.8	3.7	3.3	7680	1	2680	Shale partings.
	Coal	3.0	S	Bk	B		X				X	X	M	0.6	25.0	62.6	11.8	4.7	76.5	1.3	3.9	1.8	13390	9	2620	Pyrite partings to 1/4".
	Claystone	0.15	S	Dk gy to md dk gy																						
	Coal	0.85	S	Bk	B		X				X	X	B-MB	0.5	26.6	65.1	7.8	4.9	79.4	1.3	3.3	3.3	14200	9	2080	Some thin partings.
-	Claystone			Md dk gy																						Mine floor.

SITE/STATION NO. 66-3 (page 1)	COUNTY: Cambria	COAL SAMPLE NO(S).: 403222/784812A, 403222/784812B, 403222/784812C
COMPANY: Starford Coal Co.	LAT. °N: 40°32'07" / ELEV. (base lower coal): Appx. 2070'	
MINE:	LONG. °W: 78°47'45" / TWP.: Blacklick	
PERMIT: 614-1	GEOLOGIST: WAB / 15' QUADRANGLE: Barnesboro	JOINTING: Coal: N85W, N10W
SAMPLING METHOD: Channel	DATE: 8-13-71 / 7 1/2' QUADRANGLE: Colver	
REPORTED COAL NAMES: Lower Freeport		WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	STRATIGRAPHIC DATA				COAL	VITRAIN ABUNDANCE				VITRAIN THICKNESS				COAL ANALYSIS: PROXIMATE (%)				ULTIMATE (%)								
HIGHWALL 15' HIGHER BUT UNITS NOT ACCESSIBLE																										
0.5	Claystone		G	Md dk gy to dk gy																						Forms dark band in highwall. Not accessible.
5.0	Silty clayshale/claystone		S	Gn gy																						Thickness varies (4.0' to 1.0'). Not accessible.
0.9	Claystone		G	Md dk gy to dk gy																						Slightly carbonaceous. Forms dark band in highwall.
7.1	Limestone		G	Gn gy to ol gy, lt gy																						Hard, resistant. Interbedded with claystone in places.
0.5	Claystone		G	Md dk gy to dk gy																						Slightly carbonaceous. Forms dark band in highwall.
3.0	Claystone		S	Gn gy																						Underclay - few rootlets. Chippy fracture.
0.3	Claystone		G	Dk gy to md dk gy																						Slightly carbonaceous. Forms dark band in highwall.
5.2	Claystone			Md lt gy to lt gy, lt ol gy																						Underclay. Few rootlets. Minor internal slumping.

SITE/STATION NO. 66-3 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.3	Sandstone		G	Md gy to lt gy																						Broken plant fossils. Very fine to medium-grained sand. Bedding horizontal.
2.3	Silt shale		G	Md dk gy to md gy																						Plant fossils. Planar bedding. Grain size increases upward.
	Coal	0.2	S	Bk	B		X				X		B	3.1	24.8	59.8	12.3	4.7	72.8	1.3	4.8	4.1	12960	9	2140	Discontinuous thin shale layers.
	Claystone	0.4	S	Vy dk gy to dk gy																						Few small rootlets.
4.0	Coal	2.2	S	Bk	B		X			X	X		B MB	1.9	24.0	65.6	8.5	4.7	78.8	1.4	3.9	2.7	13840	9	2150	Discontinuous thin shale layers common. Few pyrite lenses.
	Carbonaceous claystone-clay shale	0.1	S	Vy dk gy to bk																						Few pyrite zones. Broken plant fossils.
	Coal	1.1	S	Bk	B		X				X		B MB	2.5	24.0	63.4	10.1	4.7	76.4	1.3	4.3	3.2	13360	9	2290	Few thin shaly lenses.
2.0+	Claystone		S	Md gy to md dk gy																						Rootworked. Mine floor.

SITE/STATION NO. 76-3	COUNTY: Cambria		COAL SAMPLE NO(S).: 403425/783121/2A,
COMPANY: Powell Coal Co.	LAT. °N: 40°34'25"	ELEV. (base lower coal): Appx. 1920'	403425/783121/2B
MINE: Dean strip	LONG. °W: 78°31'21"	TWP.: Dean	
PERMIT: 101-11	GEOLOGIST: GBG	15' QUADRANGLE: Patton	JOINTING: Coal: N79W, N, N65W, N70W, N15E
SAMPLING METHOD: Channel	DATE: 8-11-69	7 1/2' QUADRANGLE: Ashville	Shale: N70W, N48W, N51E
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B),Non-Banded (N),or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.0	Claystone		G	Gn gy																						
1.0	Sandstone		G	Lt bl gy																						
8.0	Sandstone		S	Lt gy to lt bl gy																						Very fine to fine grained.
2.5	Sand-silt laminite		G	Md dk gy and md gy																						Very fine to fine grained.
0.3	Clay shale		S	Dk gy to md dk gy																						
3.05	Coal	2.2	S	Bk		X					X	X	MB -B	0.6	28.8	58.9	11.7	4.7	75.5	1.2	3.1	3.8	13290	9	2030	Crumbly. Pyrite and fusain partings.
	Claystone	0.15	S	Md dk gy to ol gy																						Plant fossils.
	Coal	0.7	S	Bk	N								MB-MD	0.7	31.4	60.1	7.8	5.1	78.1	1.4	4.0	3.6	14050	9	2050	
0.3+	Claystone			Md dk gy																						Mine floor.

SITE/STATION NO. 76-4 (page 1)	COUNTY: Cambria	COAL SAMPLE NO(S).: 404338/783545/2A, 404338/783545/2B
COMPANY: Powell Coal Co.	LAT °N: 40°43'38" ELEV. (base lower coal): Appx. 1780'	
MINE: Sterling No. 3 Strip	LONG. °W: 78°35'45" TWP.: Chest	
PERMIT: 101-6a	GEOLOGIST: GBG 15' QUADRANGLE: Patton	JOINTING: Coal: N25E, N75W; shale: N21E, N47E, N69E
SAMPLING METHOD: Channel	DATE: 8-12-69 7 1/2' QUADRANGLE: Coalport	
REPORTED COAL NAMES: Lower Freeport		WEATHERING: Fresh, except top 30' weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0±	Coal blossom		S	Bk																						Poor exposure.
5.0±	Claystone		G																							Poor exposure.
20.0±	Sandstone grading up into siltstone and claystone		G	Md lt gy to gn gy																						Poor exposure.
5.5	Sand-silt laminite		S	Md dk gy and md lt gy																						
1.5	Sandstone		S	Md dk gy to lt gy																						Very fine grained.
2.0	Sand-silt laminite		S	Md dk gy and md lt gy																						
2.0	Sandstone		S	Md lt gy to lt gy																						Very fine grained.
2.5	Sand-silt laminite		G	Md dk gy and md gy																						Plant fossils.
1.2	Claystone		G	Md gy																						Plant fossils.
0.3	Coaly shale			Bk to gy bk																						Plant fossils.

SITE/STATION NO. 76-4 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			S																							
3.4	Shaly coal	0.8		Bk	B				X		X	X	MD -D	0.8	20.2	39.7	39.3	3.3	49.2	0.9	4.7	2.6	8720	2	2780	Many shale partings.
			G																							
	Coal	2.6		Bk			X				X	X	MB- MD	0.6	24.7	63.1	11.6	4.6	76.1	1.3	3.4	3.0	13460	9	2100	
			S																							
0.3+	Coaly shale			Bk																						Mine floor.

SITE/STATION NO. 76-5
COMPANY: Weakland Coal Co.
MINE: Weakland
PERMIT: 219-6a
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport
COUNTY: Cambria
LAT. °N: 40°39'16"
LONG. °W: 78°42'58"
GEOLOGIST: GBG
DATE: 8-12-69
ELEV. (base lower coal): Appx. 1840'
TWP.: Susquehanna
15' QUADRANGLE: Patton
7 1/2' QUADRANGLE: Hastings
COAL SAMPLE NO(S).: 403916/784258/2A, 403916/784258/2B
JOINTING: Coal: N82W, N73W, N30E
WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13.0	Silt-clay laminite		S	Gn gy																						
0.5	Sandstone		S	Md lt gy to md bl gy																						
2.0	Sand-silt laminite shale		G	Md dk gy and md gy																						Plant fossils.
1.0	Silt-clay laminite shale		G	Dk gy and md dk gy																						
1.5	Clay shale		S	Dk gy to md dk gy																						Plant fossils.
0.3	Coaly shale		S	Bk																						
4.45	Coal	3.4	S	Bk			X				X	X	B-MB	1.0	22.1	70.8	6.1	4.6	81.1	1.4	5.9	0.9	14040	1½	2570	Splintery. Shale partings.
	Claystone	0.5	S	Gy bk to dk gy																						
	Coal	0.55	S	Bk	B		X				X	X	B-MB	0.8	23.5	66.9	8.8	4.7	78.5	1.5	5.5	1.0	13650	7½	Above 2910	Tough.
0.1+	Claystone			Dk gy																						Mine floor.

SITE/STATION NO. 76-6	COUNTY: Cambria		COAL SAMPLE NO(S).: 403919/784301/2A, 403919/784301/2B
COMPANY: Weakland Coal Co.	LAT. °N: 40°39'19"	ELEV. (base lower coal): Appx. 1850'	
MINE: Weakland	LONG. °W: 78°43'01"	TWP.: Susquehanna	
PERMIT: 219-6a	GEOLOGIST: GBG	15' QUADRANGLE: Patton	JOINTING: Coal: N70W, N25W, N32E, N15E, N41E
SAMPLING METHOD: Channel	DATE: 8-12-69	7 1/2' QUADRANGLE: Hastings	Sandstone: N16W, N45E
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Weathered

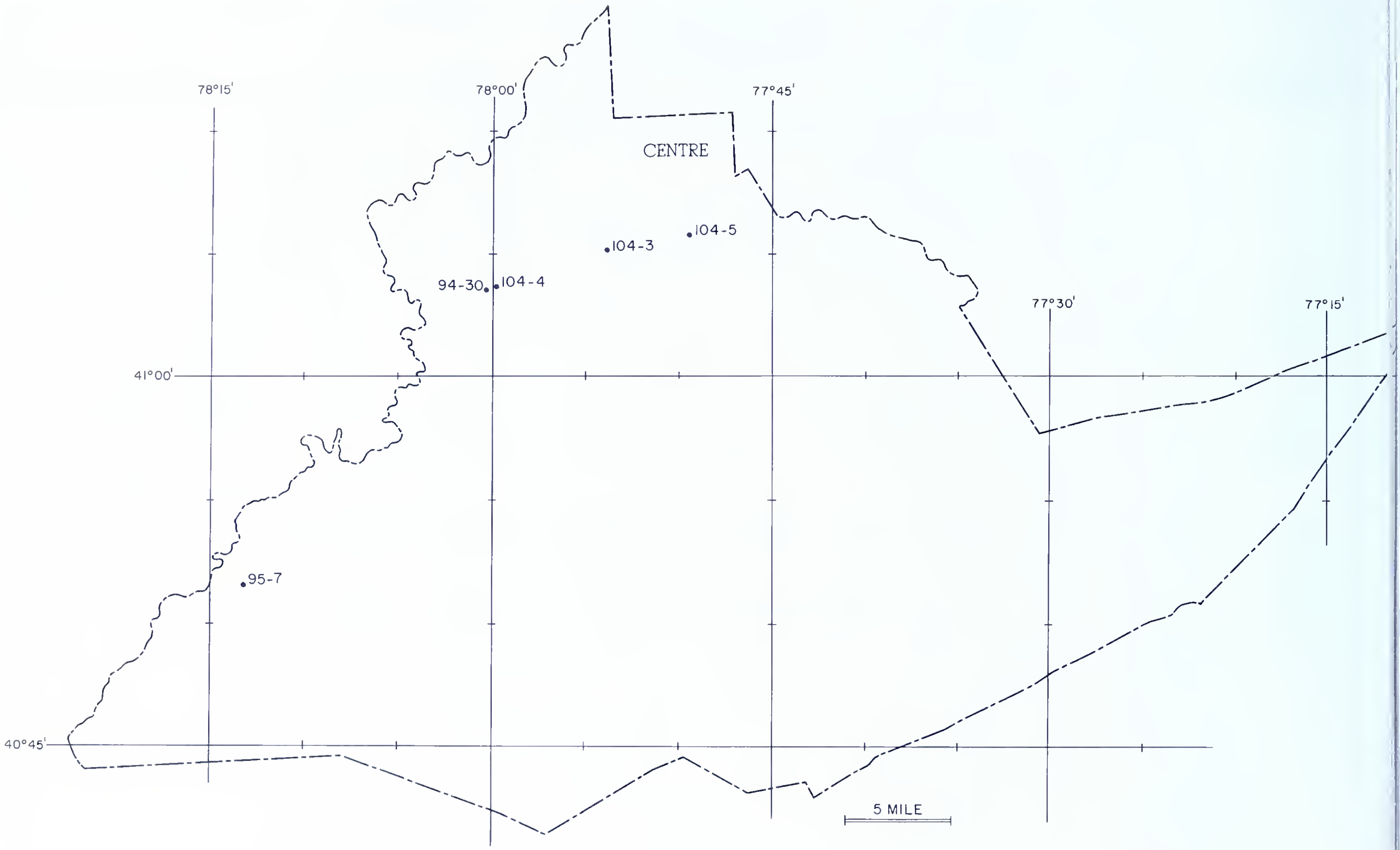
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0	Claystone			Lt gn gy																						Very weathered.
3.0	Sandstone		S	Lt ol gy																						Very fine to fine grained.
10.0	Sand-silt laminite shale		U	Md dk gy and md lt gy																						
2.5	Sand-silt laminite		G	Md dk gy and md lt gy																						
3.5	Sand-silt laminite		S	Md dk gy and md gy																						
3.0	Silt-clay laminite		G	Dk gy and md dk gy																						
3.8	Bone	0.1	S	Bk	N								D													
	Coal	2.6	S	Bk	B		X				X	X	MB-MD	0.5	23.8	65.5	10.2	4.8	78.6	1.3	4.1	1.0	13800	9	Above 2910	Pyrite partings to 0.1'.
	Claystone	0.1	S	Ol gy to ol bk																						
	Coal	1.0	S	Bk		X					X	X	B	0.6	25.6	69.1	4.7	5.0	83.9	1.4	3.3	1.7	14730	9	2060	
2.0+	Claystone		S	Md dk gy																						

SITE/STATION NO. 77-5 (page 1)	COUNTY: Cambria		COAL SAMPLE NO(S).: 402402/783705/2A, 402402/783705/2B
COMPANY: Cooney Bros. Coal Co.	LAT. °N: 40°24'02"	ELEV. (base lower coal): Appx. 2220'	
MINE:	LONG. °W: 78°37'05"	TWP.: Washington	
PERMIT: 238-6 or 238-7	GEOLOGIST: GBG	15' QUADRANGLE: Ebensburg	JOINTING: Shale: N32W, N55W, N30E, N13W, N30W
SAMPLING METHOD: Channel	DATE: 8-11-69	7 1/2' QUADRANGLE: Cresson	
REPORTED COAL NAMES: Lower Kittanning, Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.5+	Coal blossom		?	Bk																						
11.0	Underclay		G	Md gy to md lt gy																						Plastic. Some semiflint clay.
3.0	Claystone		G	Gn gy																						
2.5	Siltstone		G	Gn gy																						
1.0	Sandstone		S	Md lt gy to gn gy																						Very fine grained.
1.0	Claystone		S	Md lt gy to gn gy																						Plant fossils.
1.5	Sandstone		S	Md lt gy																						Very fine to fine grained.
2.5	Claystone		S	Md lt gy to gn gy																						Plant fossils. Very soft.
4.0	Sandstone			Md lt gy																						Very fine to fine grained.
4.0	Cover																									
0.6	Claystone		S	Bk																						Plant fossils.
0.55	Coal		S	Bk																						Many shale partings.
0.5	Clay shale			Bk																						Coaly laminations. Locally coaly shale.

SITE/STATION NO. 77-5 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S = Sharp, G = Gradational, U = Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0	Claystone		S	Md dk gy																						Siderite nodules. Plant fossils.
5.5	Silt-clay laminite		G	Md dk gy																						Siderite nodules. Invertebrate fossils (Anthraconauta sp.) present.
0.5	Claystone		G	Gy bk to dk gy																						Pyrite nodules. Plant fossils. Invertebrate fossils (Mesolobus sp.).
2.55	Coal	0.55	S	Bk	B		X				X	X	B-MB	0.5	21.2	70.5	7.8	4.6	81.5	1.4	2.4	2.3	14190	9	2130	
	Bone	0.2	S	Bk																						
	Coal	1.8	S	Bk	B		X				X	X	MB-MD	0.5	19.6	68.3	11.6	4.4	77.4	1.4	2.9	2.3	13600	9	2630	Pyrite partings.
0.4+	Claystone		S	Md dk gy																						Plant fossils.


78°15'
78°00'
77°45'
77°30'
77°15'
41°00'
40°45'
CENTRE
104-5
104-3
94-30
104-4
95-7
5 MILE

SITE/STATION NO. 94-30	COUNTY: Centre	COAL SAMPLE NO(S).: 410336/780020/A, B, C
COMPANY: Johnson & Morgan Co.	LAT. °N: 41°03'36" — ELEV. (base lower coal): Appx. 1775'	
MINE: German Mine	LONG. °W: 78°00'20" — TWP.: Burnside	
PERMIT: 490-2	GEOLOGIST: TMB — 15' QUADRANGLE: Karthaus	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-22-69 — 7 1/2' QUADRANGLE: Karthaus	
REPORTED COAL NAMES: Middle Kittanning		WEATHERING: Fresh

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Cloroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Clay shale grading up to sand-silt laminite			Dusky yl																						Platy, chippy; micaceous; plant fragments.
3.6	Coal	0.4	S	Bk	B			X				X	D-MD	1.9	21.5	61.2	15.4	4.3	71.4	1.3	7.0	0.6	12350	1½	Above 2910	Cubic; discarded in mining.
	Bony coal	0.5		Bk	B				X			X	D	1.5	15.7	34.0	48.8	2.9	40.8	0.8	6.3	0.4	7050	NC	Above 2910	Platy; discarded in mining.
	Coal	2.7		Bk	B		X					X	M-MB	1.4	22.9	69.0	6.7	4.8	80.2	1.7	5.9	0.7	13920	4½	Above 2910	Rough to almost cubic fracture.
0.5	Underclay		S	Dk gy																						Chippy, hackly.
0.5+	Underclay		G	Md gy																						Hackly, rubbly; rootlets.

SITE/STATION NO. 95-7	COUNTY: Centre		COAL SAMPLE NO(S).: 405133/781311/2A, -/2B, -/2C, -/2D
COMPANY: Hepburnia Coal Co.	LAT. °N: 40°51'33"	ELEV. (base lower coal): Appx. 1600'	
MINE: Granville	LONG. °W: 78°13'11"	TWP.: Rush	
PERMIT: 266M005	GEOLOGIST: WEE	15' QUADRANGLE: Philipsburg	JOINTING: Sandstone: N40W, N17E, N72W (dip 72SW)
SAMPLING METHOD: Channel	DATE: 10-2-70	7 1/2' QUADRANGLE: Sandy Ridge	
REPORTED COAL NAMES: "A" Coal (Clarion - Brookville -- WEE)			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30+	Sandstone			Md gy to md dk gy																						1' to 15' lenses (lateral accretion beds). Plant fossils.
5.9	Bone coal	1.1	U	Bk	B			X				X	D	3.7	18.9	34.9	42.5	3.3	42.9	0.6	6.4	4.3	7750	5	2660	White sulfate blossom.
	Coal	1.1	S	Bk	B		X					X	MB	1.0	25.8	62.7	10.5	4.6	76.8	1.1	2.3	4.7	13640	8½	2030	Large pyrite lenses.
	Clay shale	0.05	S	Bk																						Plant fossils.
	Coal	1.3	S	Bk	B		X					X	B	2.5	25.4	62.4	9.7	4.9	77.1	1.2	4.7	2.4	13590	8½	2670	Pyrite lenses. Fusain partings.
	Interbedded clay shale and bone	0.05	S	Gy bk to bk																						Plant fossils.
	Coal	2.3	S	Bk	B			X				X	MB to M	4.5	24.0	59.3	14.4	4.5	72.4	1.0	4.9	2.8	12760	8½	2770	
1.0+	Underclay		S	Md lt gy																						Floor. Plastic.

SITE/STATION NO. 104-3
COMPANY: Corlin, Inc.
MINE: Mine No. 11
PERMIT: 134-15
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Clarion ("A")
COUNTY: Centre
LAT. °N: 41°05'03"
LONG. °W: 77°53'57"
GEOLOGIST: TMB
DATE: 8-20-69
ELEV. (base lower coal): Appx. 1500'
TWP.: Snow Shoe
15' QUADRANGLE: Snow Shoe
7 1/2' QUADRANGLE: Snow Shoe
COAL SAMPLE NO(S).: 410503/775357
JOINTING: N30W, vert.; N50E, vert.
WEATHERING: Fairly fresh

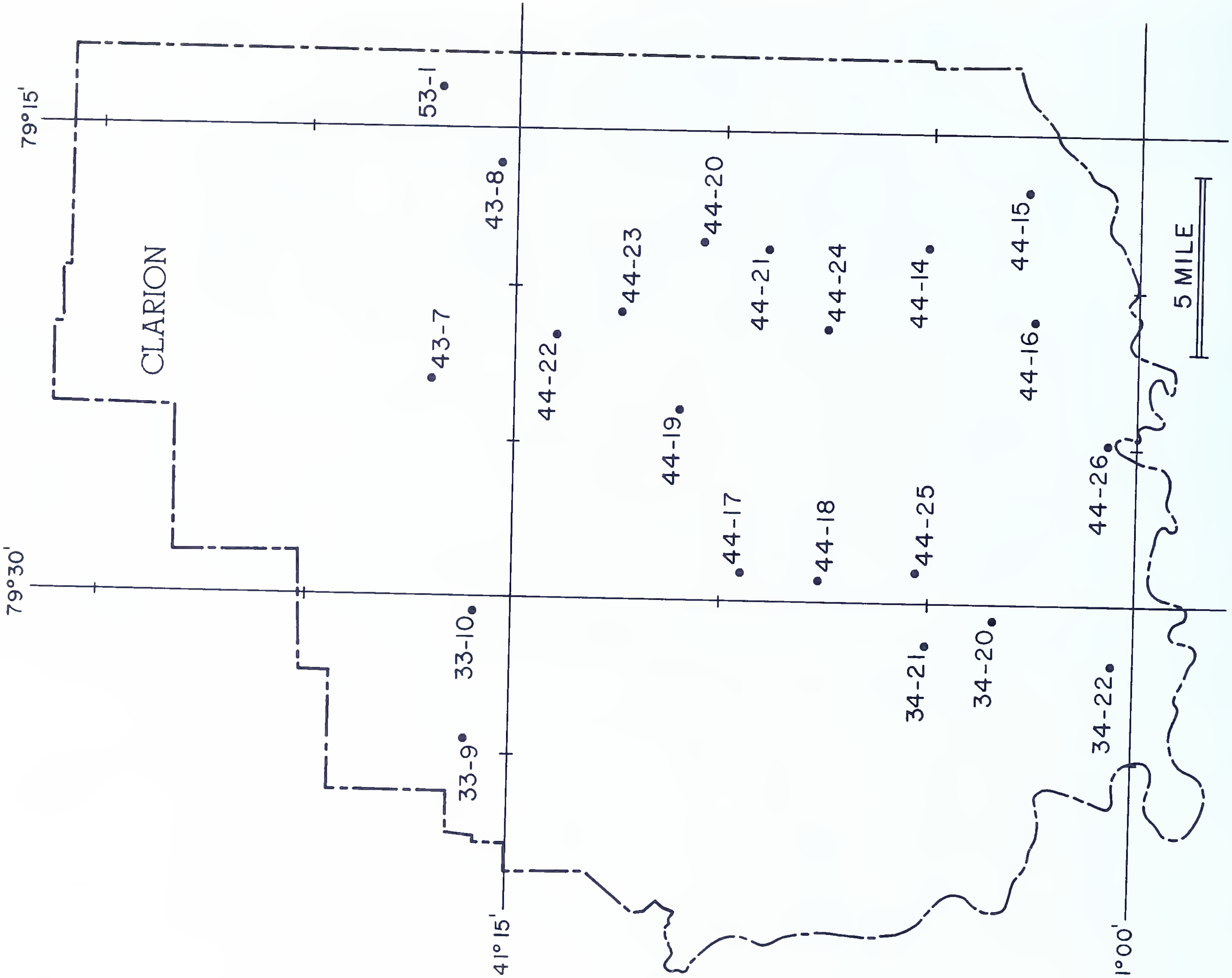
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
5.0±	Sandstone			Vy lt gy																						Chippy, flaggy, slabby; micaceous, fine grained.
10.0+	Interbedded silt shale and clay shale		G	Lt ol gy																						Chippy, slabby; micaceous.
14.0	Siltstone grading up to sandstone		G	Md gn gy																						Chippy, slabby; micaceous; silt sized to very fine grained.
0.1	Coal		S	Bk																						Laterally discontinuous.
4.0±	Claystone		S	Lt ol gy																						Hackly; soft; underclay horizon; laterally discontinuous.
22.0	Clay shale grading up through silt shale to siltstone		G	Md dk gy																						Chippy, slabby; micaceous; abundant plant leaves.
7.0	Carbonaceous claystone		G	Gy bk																						Hard, blocky, hackly.
0.8	Coaly clay shale		S	Bk																						Chippy; vitrain lenses throughout.
1.9	Coal		S	Bk	B	X					X	X	M-MD	0.8	21.7	68.3	9.2	4.5	79.2	1.4	3.6	2.1	13890	9	2680	Abnormal cleat at oblique angle to seam; discontinuous clay shale parting at middle of seam; some knife-edge pyrite partings.
0.2+	Clay shale		S	Gy bk																						Chippy, hackly; very carbonaceous; underclay horizon; silty.

SITE/STATION NO. 104-4
COMPANY: Johnson & Morgan Co.
MINE: German
PERMIT: 490-3
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning
COUNTY: Centre
LAT. °N: 41°03'37"
LONG. °W: 77°59'50"
GEOLOGIST: TMB
DATE: 8-26-69
ELEV. (base lower coal): Appx. 1755'
TWP.: Snow Shoe
15' QUADRANGLE: Snow Shoe
7 1/2' QUADRANGLE: Snow Shoe
COAL SAMPLE NO(S).: 410337/775950/A, C
JOINTING: N30W, vert.; N65E, vert.
WEATHERING: Fairly fresh; wet when sampled

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
5.0+	Sand-silt laminite grading up to sandstone		G	Md lt gy																						Platy, chippy, flaggy, slabby; silt sized grading up to coarse grained; micaceous; plants.
3.0	Silt shale		G	Md gy																						Chippy; clayey; micaceous.
2.0	Clay shale		G	Md dk gy																						Chippy; rare siderite nodules; common plant leaves.
3.5	Sand-silt laminite		S	Md gy																						Platy, chippy; micaceous; abundant plant fragments.
8.0	Coal	0.6	S	Bk	B			X				X	D-MD	1.2	18.2	44.0	36.6	3.5	52.9	1.0	5.4	0.6	9140	1½	Above 2910	Blocky fracture; some fusain.
	Coal	1.3	G	Bk	B	X					X	X	M-MB													Splintery to cubic fracture.
	Coaly clay shale grading up to coal	1.0	G	Gy bk																						Chippy, hackly; not sampled; abundant vitrain.
	Clay shale and claystone	1.0	S	Md dk gy																						Hackly; abundant rootlets; abundant thin vitrain layers near top.
	Coal stringer	0.3	S	Bk	B																					
	Claystone	2.5	S	Md dk gy																						Hackly; abundant plant fragments and rootlets.
	Coal	1.3	S	Bk	B		X					X	M-MD	1.2	24.4	63.9	10.5	4.7	75.7	1.4	6.2	1.5	13310	9	Above 2910	Crumbly; thin bony parting near middle.
1.0+	Underclay			Md dk gy																						Hackly, rubbly; rootlets.

SITE/STATION NO. 104-5	COUNTY: Centre		COAL SAMPLE NO(S).: 410544/774931
COMPANY: S & D Trucking Co.	LAT. °N: 41°05'44"	ELEV. (base lower coal): Appx. 1410'	
MINE: Cookhouse Mine	LONG. °W: 77°49'31"	TWP.: Snow Shoe	
PERMIT: 516-1	GEOLOGIST: TMB	15' QUADRANGLE: Snow Shoe	JOINTING:
SAMPLING METHOD: Channel (very wet)	DATE: 8-20-69	7 1/2' QUADRANGLE: Snow Shoe SE	
REPORTED COAL NAMES: Clarion ("A")			WEATHERING: Fresh

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
10.0+	Sandstone			Md dk gy																						Slabby, blocky; micaceous; fine grained; cuts down into underlying unit.
12.0±	Interbedded clay shale, silt shale, sand-silt laminite, and sandstone		S	Gy bk to md lt gy																						Chippy, flaggy, slabby, blocky; micaceous; common plant fossils; sandstone is fine grained; scattered coaly matter.
3.1	Coal	0.6	S	Bk	M			X				X	D-MD													Blocky fracture; almost canneloid.
	Coal	2.5	S	Bk	B		X	X				X	M-D	0.5	22.7	64.5	12.3	4.5	77.1	1.4	3.9	0.8	13380	8½	Above 2910	Rough to splintery fracture; knife-edge pyrite partings and some ½" lenses of pyrite.
2.0+	Underclay		S	Md dk gy																						Rubbly; slightly silty; abundant rootlets.


79°15'
79°30'
41°15'
41°00'
CLARION
5 MILE
53-1
43-8
43-7
44-20
44-23
44-22
44-21
44-24
44-19
44-14
44-15
44-16
44-17
44-18
44-25
44-26
33-10
33-9
34-21
34-20
34-22

SITE/STATION NO. 33-9
COMPANY: Harold A. Seigel Coal Co.
MINE: Seigel #15
PERMIT: 8-10
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Clarion
LAT. °N: 41°16'07"
LONG. °W: 79°34'37"
GEOLOGIST: ADG
DATE: 7-31-69

ELEV. (base lower coal): Appx. 1530'
TWP.: Ashland
15' QUADRANGLE: Oil City
7 1/2' QUADRANGLE: Kossuth

COAL SAMPLE NO(S).: 411605/793431/2A, 411605/793431/2B
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Soil cover																									NOTE: Coal not exposed where section was measured.
0.2	Coal		S	Bk																						Too weathered for sampling.
3.0	Claystone		S	Md lt gy																						Silty.
7.0	Silt shale		G	Ol gy																						
5.0	Interbedded sandstone and siltstone		G	Md lt gy																						Sandstone is fine grained.
6.5	Clay shale		S	Md gy																						Siderite nodules and bands common. Becomes silty near top.
0.5	Silt shale		S	Bk																						
2.0	Cover																									
	Coal	0.2		Bk																						Tough, bony.
2.1	Coal	1.0	S	Bk	B		X				X		M-MB	2.1	39.6	53.5	4.8	5.6	77.4	1.5	9.8	0.9	13810		2910+	Cubic fracture.
	Coal	0.9	S	Bk	B		X				X		M-MB	1.8	37.5	48.0	12.7	5.1	70.4	1.5	8.4	1.9	12540		2910+	Few sulfur streaks.
0.2+	Claystone		S	Md lt gy																						Mine floor.

SITE/STATION NO. 33-10	COUNTY: Clarion		COAL SAMPLE NO(S).: 411556/793033/2A, 411556/793033/2B, 411556/793033/4	
COMPANY: A. P. Weaver & Sons	LAT. °N: 41°15'56"	ELEV. (base lower coal): Appx. 1480'		
MINE: McConny Strip	LONG. °W: 79°30'33"	TWP.: Ashland		
PERMIT: 144-14	GEOLOGIST: ADG	15' QUADRANGLE: Oil City	JOINTING:	
SAMPLING METHOD: Channel	DATE: 7-31-69	7 1/2' QUADRANGLE: Kossuth		
REPORTED COAL NAMES: Lower Clarion, Upper Clarion			WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Clay shale			Md lt gy																						Soil cover. Abundant siderite nodules. Invertebrate fossil found.
1.8	Coal		S	Bk	B		X				X	X	M-MB	1.7	37.6	48.8	11.9	5.0	69.8	1.3	7.1	4.9	12650		2040	
10.0±	Cover																									Some sandstone in this interval.
12.0+	Clay shale			Md lt gy																						
1.9	Coal	1.3	S	Bk	B			X		X	X		M-MB	1.4	40.4	49.6	8.6	5.3	74.1	1.3	6.6	4.1	13400		2080	Bony, tough. Few thin pyrite lenses.
	Bone parting	0.35	S	Bk																						Tough.
	Coal	0.25	S	Bk	B			X			X		M-MB	1.5	37.0	48.8	12.7	4.9	69.7	1.3	8.0	3.4	12560		2180	Few thin pyrite lenses.
0.2+	Claystone		S	Md gy																						Mine floor. Slickensides.

SITE/STATION NO. 34-20 (page 1)	COUNTY: Clarion	COAL SAMPLE NO(S).: 410325/793042/9
COMPANY: Pa. Dept. of Health	LAT. °N: 41°03'25" ELEV. (base lower coal): Appx. 1219'	
MINE:	LONG. °W: 79°30'42" TWP.: Toby	
PERMIT:	GEOLOGIST: WAB 15' QUADRANGLE: Foxburg	JOINTING:
SAMPLING METHOD: Drill Core	DATE: 1-6-71 7 1/2' QUADRANGLE: Rimersburg	
REPORTED COAL NAMES: Lower Kittanning		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0	Surface material		G																							No recovery.
4.3	Interlaminated silt-clay shale		G	Dk gy to md gy																						Broken plant fossils. Planar bedding.
1.0	Clay shale		G	Md gy to md dk gy																						Invertebrate fossils (Mesolobus sp., Desmoinesia sp.).
1.7	Clay shale		S	Bk to dk gy																						Highly carbonaceous. Few invertebrate fossils (Aviculopectin sp., Linoproductus sp.).
6.4	Interlaminated silt-clay shale		S	Dk gy to md dk gy																						Broken plant fossils. Planar bedding.
1.4	Clay shale		S	Dk gy to md dk gy																						Planar bedding. Siderite nodules common.
3.6	Coal		S	Bk	B		X			X	X		B, MB, M, MD	1.1	38.1	50.3	10.5	5.2	73.4	1.4	6.0	3.5	13280	8	2140	0.1' parting 2.5' above base.
1.0	Claystone		S	Md gy to md lt gy, md ol gy																						Seat earth, rooted.
0.9	Interlaminated silt-clay shale			Dk gy																						Subplanar bedding. Plant fossils.

SITE/STATION NO. 34-20 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN ABUN-DANCE				VITRAIN THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.5	Claystone		S	Md gy to md lt gy																						Seat earth, roots common. Soft,plastic.
2.6	Claystone		G	Md lt gy, gn gy, lt ol gy																						Seat earth, few roots. Semi-hard.
1.2	Clay shale		G	Md ol gy																						Planar bedding. Few oolites and roots.
0.9	Claystone		S	Md gy to md ol gy																						Seat earth, rooted. Oolitic.
1.1	Clay shale		G	Md dk gy																						Rooted. Subplanar bedding.
2.8	Claystone		S	Md dk gy to md lt gy, ol gy																						Seat earth. Rooted.

SITE/STATION NO.: 34-21 (page 1)	COUNTY: Clarion			COAL SAMPLE NO(S).: 410507/793128/6A, 410507/793128/6B	
COMPANY: Allison Engineering Co.	LAT. °N: 41°05'07"	ELEV. (base lower coal): 1310'±			
MINE:	LONG. °W: 79°31'28"	TWP.: Toby			
PERMIT: 39-42	GEOLOGIST: JDI-VWS	15' QUADRANGLE: Foxburg		JOINTING: Coal: N60W (face), N39E (butt)	
SAMPLING METHOD: Face channel	DATE: 8-22-74	7 1/2' QUADRANGLE: Rimersburg			
REPORTED COAL NAMES: Middle(?) Kittanning (C)				WEATHERING: Moderately weathered	

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Sand-silt laminite		G																							
30.0	Sandstone		U	Vy lt gy																						Numerous channel cut-and-fills. Shale-pebble conglomerates scattered throughout. Fine grained. Plant fragments frequent.
5.5	Silt-clay laminite shale		G	Md dk gy to vy lt gy																						Carbonaceous. Pyritic.
2.5	Coal	0.4		Bk to gy bk	B		X	X				X	MD	1.9	40.2	49.4	8.5	5.4	74.9	1.3	7.1	2.7	13530	6½	2180	Bony, hard, blocky.
	Coal	2.1	S	Bk to gy bk	B	X					X	X	MD	2.1	40.5	47.6	9.8	5.3	72.5	1.3	4.8	6.3	13130	7	2190	Pyritic. Fusain partings at 0.6' and 1.0' above base.
7.0	Claystone (underclay)		G	Lt gy																						Somewhat silty. Rootlets common.
3.6	Sand-silt laminite		S	Md lt gy to lt gy																						
3.5	Silty clay shale		G	Md lt gy																						Weathers light olive gray.
1.0	Silt-clay laminite shale		G	Gy bk to md lt gy																						Carbonaceous with thin vitrain lenses.
4.2	Claystone (underclay)			Md dk gy to lt gy																						Rootlets common.

SITE/STATION NO. 34-21 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0	Silt shale		G	Md lt gy																						Large lenses of fine sand in upper part.
4.5	Silty clay shale		G	Md gy																						Weathers light olive gray; well jointed. Siderite nodules rare.
0.05	Siderite		S	Md gy																						Thin, continuous band.
10.0	Clay shale		S	Dk gy																						Siderite nodules abundant. Plant stems and fragments frequent.
20.6	Clay shale		S	Dk gy to md gy																						Well jointed. Plant stems, leaves, and fragments abundant.
	Coal(?)																									Not exposed (back filled).

SITE/STATION NO. 34-22
COMPANY:
MINE:
PERMIT:
SAMPLING METHOD: Face channel
REPORTED COAL NAMES: Upper Freeport (E)

COUNTY: Clarion
LAT. °N: 41°00'38"
LONG. °W: 79°32'00"
GEOLOGIST: JDI-VWS
DATE: 8-22-74

ELEV. (base lower coal): 1425'±
TWP.: Madison
15' QUADRANGLE: Foxburg
7 1/2' QUADRANGLE: Rimersburg

COAL SAMPLE NO(S).: 410038/793200/2A, 410038/793200/2B
JOINTING: Coal: N62W (face), N31E (butt)
Sandstone: N40W
WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
38.0+	Sandstone			Vy lt gy																						Predominately planar bedded, with minor festoon crossbeds; rare channel cut-and-fills; fine grained.
3.4	Carbonaceous clay shale	0.3	U	Gy bk																						Pyrite abundant; fusain rare.
	Coal	1.6		Bk	B	X				X	X	X	M	2.7	40.0	51.9	5.4	5.5	76.4	1.4	8.4	2.9	13790	7	2130	Knife-edge fusain partings; pyrite common, in discontinuous bands.
	Fusain	0.1		Gy bk																						Parting. Clay-rich, with abundant pyrite.
	Coal	1.4		Bk	8	X	X				X		M-MD	3.1	35.1	48.3	13.5	5.0	68.9	1.4	8.9	2.3	12400	7	2180	
	Claystone (underclay)		S	Lt gy																						Plastic; rootlets common.

SITE/STATION NO. 43-7
COUNTY: Clarion
COAL SAMPLE NO(S).: 411700/792305
COMPANY: Zacherl Coal Co., Inc.
LAT. °N: 41°17'00"
ELEV. (base lower coal): Appx. 1560'
MINE: No. 15-B
LONG. °W: 79°23'05"
TWP.: Paint
PERMIT: 73-10
GEOLOGIST: ADG
15' QUADRANGLE: Tionesta
JOINTING: Sandstone: N10W
SAMPLING METHOD: Channel
DATE: 7-24-69
7 1/2' QUADRANGLE: Fryburg
REPORTED COAL NAMES: Clarion
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS													
						VITRAIN							PROXIMATE (%)			ULTIMATE (%)										
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
68.0±	Sandstone			Lt gy																						Crossbedded.
2.7	Coal		S	Bk	B			X			X	X	M-MD	1.3	40.4	46.5	11.8	5.1	71.5	1.3	4.4	5.9	12880		2100	Thin pyrite lenses. Partly deep mined.
0.5+	Claystone		S	Lt gy																						Mine floor.

SITE/STATION NO. 43-8	COUNTY: Clarion		COAL SAMPLE NO(S).: 411526/791607/2A, 411526/791607/2B		
COMPANY: H & G Coal and Clay Co., Inc.	LAT. °N: 41°15'26"	ELEV. (base lower coal): Appx. 1630'			
MINE: H & G #17	LONG. °W: 79°16'07"	TWP.: Tionesta			
PERMIT: 75-13	GEOLOGIST: ADG	15' QUADRANGLE: Tionesta	JOINTING:		
SAMPLING METHOD: Channel	DATE: 7-25-69	7 1/2' QUADRANGLE: Lucinda			
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Moderate		

STRATIGRAPHIC DATA — COAL ANALYSIS

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0	Clay shale		U	Dk gy																						Soil developed on top. Siderite nodules common in lower part.
0-0.7	Siderite		S	Rds gy																						Bedded.
12.0	Clay shale		S	Md gy																						Siderite bands common. Invertebrate fossils (Lingula sp. rare). Becomes dark gray upward.
2.2	Bony coal	1.0	S	Bk	B				X		X	X	M-MD	1.5	39.7	50.0	8.8	5.4	75.5	1.6	7.7	1.0	13540		2910	Tough.
	Coal	1.2	S	Bk	B		X				X		M-MB	1.6	35.7	51.6	11.1	5.1	72.0	1.4	7.5	2.9	13020		2050	Small amount of pyrite.
0.2+	Claystone			Tns gy																						Mine floor.

SITE/STATION NO. 44-14	COUNTY: Clarion		COAL SAMPLE NO(S).: 410504/791848
COMPANY: Mauersburg Coal Co.	LAT. °N: 41°05'04"	ELEV. (base lower coal): Appx. 1620'	
MINE: Allison Strip	LONG. °W: 79°18'48"	TWP.: Redbank	
PERMIT: 344-12	GEOLOGIST: ADG	15' QUADRANGLE: Clarion	JOINTING: Sandstone: S45W, S50W, N-S
SAMPLING METHOD: Channel	DATE: 7-22-69	7 1/2' QUADRANGLE: New Bethlehem	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sandstone		G	01 gy																						Soil developed on top with coal blossom. Fine to very fine grained.
4.0	Sand-silt laminite		G	01 gy																						
12.0	Clay shale		S	Md dk gy																						Silty. Abundant siderite bands. Marine fossils.
1.7	Coal		S	Bk	B		X				X		M-MD	1.8	33.0	53.2	12.0	4.8	71.6	1.4	7.8	2.4	12820		2450	Rare pyrite nodules.
0.3+	Claystone			Tns gy																						Mine floor. Slickensides.

SITE/STATION NO.: 44-15	COUNTY: Clarion		COAL SAMPLE NO(S).: 410243/791659/2A, 410243/791659/2B, 410243/791659/2C
COMPANY: Fairhill Coal Co.	LAT. °N: 41°02'43"	ELEV. (base lower coal): 1420'±	
MINE:	LONG. °W: 79°16'59"	TWP.: Redbank	
PERMIT: 602-3	GEOLOGIST: VWS-JDI	15' QUADRANGLE: Clarion	JOINTING: Coal: N54W (face); N35E (butt)
SAMPLING METHOD: Face channel	DATE: 8-20-74	7 1/2' QUADRANGLE: New Bethlehem	
REPORTED COAL NAMES: Upper Freeport (E)			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25.0+	Sandstone			Vy lt gy																						Mostly planar bedded. Fine grained. Plant stems and trunks frequent.
6.4	Sand-silt laminite		U	Md lt gy																						Siderite nodules frequent. Plant fragments frequent.
0.5	Silt-clay laminite shale		G	Ol gy																						Discontinuous, coaly zone to 0.3' thick at top. Very fine cross laminations. Plant fragments frequent.
4.4	Shaly coal	0.6	G	Bk to gy bk	B		X				X	X	D													Clayey. Roof rock in old abandoned mine.
	Coal	1.5		Bk	B		X					X	M	3.0	34.1	51.8	11.1	5.1	71.5	1.4	10.2	0.7	12720	5½	2910+	Knife-edge clay-fusain partings, becoming more numerous upward.
	Fusain	0.1		Gy bk																						Parting. Clay-rich, with thin vitrain lenses.
	Coal	1.3		Bk	B	X					X		B	3.2	36.3	56.3	4.2	5.5	78.2	1.5	9.6	1.0	13980	8	2460	
	Silty clay	0.1		Gy bk																						Parting. Vitrain lenses common.
	Coal	0.8		Bk	B		X				X	X	M	3.0	31.9	51.3	13.8	4.9	69.8	1.4	9.1	1.0	12450	8	2780	
	Claystone (underclay)		S	Md dk gy																						Plastic; rootlets common.

SITE/STATION NO. 44-16	COUNTY: Clarion		COAL SAMPLE NO(S).: 410229/792102/2A, 410229/792102/2B
COMPANY: Clyde Miles Coal Co.	LAT. °N: 41°02'29"	ELEV. (base lower coal): 1500'±	
MINE:	LONG. °W: 79°21'02"	TWP.: Porter	
PERMIT: 509-9	GEOLOGIST: VWS-JDI	15' QUADRANGLE: Clarion	JOINTING: Coal: N65W (face); N24E (butt)
SAMPLING METHOD: Face channel	DATE: 8-21-74	7 1/2' QUADRANGLE: New Bethlehem	
REPORTED COAL NAMES: Middle Kittanning (C)			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Clay shale			Gy bk																						Sulfurous.
4.2	Silt-clay laminite shale			Dk gy to md gy																						Very uniform planar bedding.
2.0	Coal	0.6	S	Bk	B		X					X	M-MD	2.1	37.7	54.2	6.0	5.5	78.1	1.5	8.0	0.9	13980	8	2580	Vitrain decreases upward.
	Fusain	0.1		Gy bk																						Parting. Clay-rich, with thin lenses of vitrain.
	Coal	1.3		Bk	B		X				X	X	MD	2.5	38.0	54.5	5.0	5.5	78.5	1.5	8.7	0.8	14090	7½	2620	
	Claystone (underclay)		S	Md gy																						Plastic; rootlets common.

SITE/STATION NO.	44-17	COUNTY:	Clarion	COAL SAMPLE NO(S).:	410936/792912/2A, 410936/792912/2B
COMPANY:	C & K Coal Co.	LAT. °N:	41°09'36"	ELEV. (base lower coal):	Appx. 1340'
MINE:	No. 69	LONG. °W:	79°29'12"	TWP.:	Piney
PERMIT:	4-57	GEOLOGIST:	ADG	15' QUADRANGLE:	Clarion
SAMPLING METHOD:	Channel	DATE:	7-24-69	7 1/2' QUADRANGLE:	Clarion
REPORTED COAL NAMES:	Clarion			JOINTING:	
				WEATHERING:	Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0	Sandstone		U	Mod. or. pink																						Medium grained. Soil developed at top. In places cuts out underlying unit.
0-2.0	Clay shale		G	Md dk gy																						
7.0	Clay shale		S	Md gy																						Siderite nodules common.
4.6	Bone	0.7	S	Bk																						Tough.
	Coal	2.7	S	Bk	B		X				X		B-MB	1.3	40.8	50.4	7.5	5.3	75.8	1.4	6.2	3.8	13670		2120	Pyrite lens.
	Bone parting	0.35	S	Bk																						Tough.
	Coal	0.85	S	Bk	B			X			X	X	M-MB	1.2	38.6	46.5	13.7	4.9	68.9	1.2	6.5	4.8	12560		2180	Pyrite lens.
0.1+	Claystone			Md gy																						Mine floor.

SITE/STATION NO. 44-18	COUNTY: Clarion	COAL SAMPLE NO(S).: 410740/792918/2, 410740/792918/4A, 410740/792918/4B
COMPANY: C & K Coal Co.	LAT. °N: 41°07'40" ELEV. (base lower coal): Appx. 1260'	
MINE: No. 54	LONG. °W: 79°29'18" TWP.: Piney	
PERMIT: 4-54	GEOLOGIST: ADG 15' QUADRANGLE: Clarion	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-24-69 7 1/2' QUADRANGLE: Clarion	
REPORTED COAL NAMES: Clarion		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sand-silt laminite		S	Md lt gy																						Silt predominates.
0.5	Sandstone		G	Lt gy																						Fine grained.
9.0	Sand-silt laminite		G	Md lt gy																						Silt predominates.
2.2	Sandstone		S	Lt gy to white																						Abundant siderite nodules in lower part. Few coal spars. Coarse grained.
0.3	Silt shale		S	Dk gy																						Thin pyrite lenses.
3.5	Coal	0.6	S	Bk	B			X			X	X	D-MD	1.0	41.2	47.7	10.1	5.1	73.3	1.2	5.0	5.3	13360		2060	
	Bone parting	0.1	S	Bk																						Tough.
	Coal	2.2	S	Bk	B			X			X	X	D-MD	1.1	40.9	49.7	8.3	5.3	75.1	1.4	5.5	4.4	13610		2120	Thin pyrite lenses abundant.
	Clay shale	0.3	S	Dk gy																						
	Bone	0.3	S	Bk																						Tough. Discontinuous thin coal layers.
6.0	Claystone		S	Md gy																						Unit thickens to southwest. Slickensides. Root worked.
2.6	Coal		S	Bk				X			X	X	M-MD	1.0	38.9	45.9	14.2	5.0	69.6	1.2	4.8	5.2	12760		2140	Abundant pyrite lenses.
0.1+	Claystone			Md dk gy																						Few plant fragments. Mine floor.

SITE/STATION NO. 44-19	COUNTY: Clarion		COAL SAMPLE NO(S).: 411100/792400/2
COMPANY:	LAT. °N: 41°11'00"	ELEV. (base lower coal): 1440'±	
MINE:	LONG. °W: 79°24'00"	TWP.: Monroe	
PERMIT:	GEOLOGIST: JDI-VWS	15' QUADRANGLE: Clarion	JOINTING: Coal: N60W (face); N30E (butt)
SAMPLING METHOD: Face channel	DATE: 8-20-74	7 1/2' QUADRANGLE: Clarion	
REPORTED COAL NAMES: Charion (A'), Scrubgrass			WEATHERING: Weathered to very weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil																									
1.0	Coal			Bk																						Blossom. Deeply weathered.
5.0	Claystone (semi-hard clay)		S	Md lt gy																						Brecciated. Siderite nodules abundant. Pops and slakes when wetted.
6.0	Claystone (underclay)		G	Ol gy																						Contains some hard silty lenses. Slickensides. Rootlets common.
8.0	Siltstone		G	Lt gy																						Weathers light olive gray. Siderite nodules abundant.
10.0	Sandstone		G	Vy lt gy																						Mostly planar bedded; fine grained.
2.0	Sandstone		U	Vy lt gy																						Fine grained. Plant stems abundant. Forms dark band on highwall.
11.0	Sandstone		G	Vy lt gy																						Planar bedded, with channel cut-and-fills. Shale-pebble conglomerate at base. Plant stems common.
0.7	Clay shale		U	Md dk gy																						Locally cut out by overlying sandstone.
3.8	Coal		S	Bk	B			X	X			X	MB	2.3	39.1	49.5	9.1	5.1	71.3	1.2	6.7	6.6	13160	8	2300	Pyrite abundant.
1.0	Carbonaceous clay shale			Gy bk to dk gy																						Slickensides. Minor amount of coalified plant debris.
	Claystone (underclay)		S	Dk gy																						Slightly plastic; rootlets common.

SITE/STATION NO. 44-20	COUNTY: Clarion		COAL SAMPLE NO(S).: 411035/791843
COMPANY: John Wilson Coal Co.	LAT. °N: 41°10'35"	ELEV. (base lower coal): Appx. 1520'	
MINE: Port Eberline Strip	LONG. °W: 79°18'43"	TWP.: Clarion	
PERMIT: 502-1	GEOLOGIST: ADG	15' QUADRANGLE: Clarion	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-22-69	7 1/2' QUADRANGLE: Strattanville	
REPORTED COAL NAMES: Middle Kittanning or Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.0	Sandstone		G	Md lt gy																						Fine to medium grained.
15.0	Clay shale		S	Md gy																						Few sandstone laminae toward top.
1.75	Coal		S	Bk	B			X	X		X	X	M-MD	1.4	37.5	56.3	4.8	5.3	79.1	1.5	7.6	1.7	14120		2080	Tough, discontinuous thin bony layers. Few pyrite lenses.
0.5+	Claystone			Tan																						Mine floor. Slickensides.

SITE/STATION NO. 44-21
COMPANY: Clyde Miles Coal Co.
MINE: Miles #1 Strip
PERMIT: 509-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Clarion

COUNTY: Clarion
LAT. °N: 41°08'58"
LONG. °W: 79°18'54"
GEOLOGIST: ADG
DATE: 7-22-69

ELEV. (base lower coal): Appx. 1520'
TWP.: Limestone
15' QUADRANGLE: Clarion
7 1/2' QUADRANGLE: Strattanville

COAL SAMPLE NO(S).: 410858/791854/2A,
410858/791854/2B
JOINTING: Sandstone: S16E, S20E
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN							PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Sandstone		S	Lt gy																						Fine to medium grained.
5.5-7.0	Silt shale		U	Dk ol gy																						Cuts out underlying unit.
0-1.5	Claystone		G	Lt gy																						Slickensides. Underclay.
10.0	Clay shale		S	Md gy																						Siderite bands and concretions common. Abundant invertebrate fossils (*Lingula* sp.) at base.
2.4	Coal	1.6	S	Bk	B		X				X	X	M-MB	1.1	36.2	44.7	18.0	4.6	65.4	1.1	3.5	7.4	11990		2080	Slightly bony, tough. Thin pyrite lenses.
	Bone parting	0.2	S	Bk																						Tough. Not sampled.
	Coal	0.6	S	Bk	B		X				X		M-MB	1.0	38.6	48.8	11.6	5.1	72.3	1.3	6.0	3.7	13010		2410	Thin pyrite lenses.
?	Silt shale			Dk gy																						Top only seen. Mine floor.

SITE/STATION NO. 44-22	COUNTY: Clarion		COAL SAMPLE NO(S).: 411402/792146/2B
COMPANY: G. A. Stiles Co.	LAT. °N: 41°14'02"	ELEV. (base lower coal): Appx. 1480'	
MINE: Stiles #7 and #8	LONG. °W: 79°21'46"	TWP.: Highland	
PERMIT: 106-1(7A)	GEOLOGIST: ADG	15' QUADRANGLE: Clarion	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-21-69	7 1/2' QUADRANGLE: Strattanville	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	Vitrain Abundance > 60%	Vitrain Abundance 30-60%	Vitrain Abundance 15-30%	Vitrain Abundance < 15%	Vitrain Thickness > 5 mm	Vitrain Thickness 2-5 mm	Vitrain Thickness 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
<31.0	Sandstone			Md lt gy																						Cuts out some of underlying unit. Fine to medium grained. Some crossbedding and few thin discontinuous coal layers.
2.5-9.0	Clay shale		U	Md gy																						Siderite nodules common. Marine fossils.
0.2	Silt shale		S	Md gy																						Lumpy bedded. Pyrite.
5.0	Bone coal	2.0	S	Bk	B				X				D-MD													Pyrite lenses.
	Coal	1.6	S	Bk	B		X				X		M-MB	1.2	41.3	48.3	9.2	5.2	73.5	1.3	5.9	4.9	13410		2130	Pyrite lenses common.
	Bone coal	2.0	S	Bk	B				X				D-MD													Thin pyrite lenses.
0.5+	Claystone		S	Md gy																						Mine floor. Plant fragments common at top.

SITE/STATION NO. 44-23	COUNTY: Clarion		COAL SAMPLE NO(S).: 411241/792055/1A, 411241/792055/1B, 411241/792055/1C
COMPANY: Zacherl Coal Co., Inc.	LAT. °N: 41°12'41"	ELEV. (base lower coal): 1440'±	
MINE:	LONG. °W: 79°20'55"	TWP.: Clarion	
PERMIT: 73-17	GEOLOGIST: JDI-VWS	15' QUADRANGLE: Clarion	JOINTING: Coal: N70W (face); N32E (butt)
SAMPLING METHOD: Face channel	DATE: 8-19-74	7 1/2' QUADRANGLE: Strattanville	
REPORTED COAL NAMES: Clarion (A')			WEATHERING: Moderately weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Sandstone and silt shale, interbedded		G																							
15.0	Sandstone			Lt gy																						Channel cut-and-fills. Plant fragments common.
2.0	Silt shale		G	Dk gy																						
20.0	Sandstone		G	Lt gy																						Mostly planar bedded, with channel cut-and-fills; fine grained. Plant stems and trunks common.
2.0	Sand-silt laminite		U	Md dk gy to lt gy																						Shale-pebble conglomerate at base. Plant stems and trunks abundant.
1.6	Clay shale		G	Dk gy																						Siderite nodules abundant.
2.2	Clay shale		S	Dk gy																						
3.65+	Bony coal	0.6		Gy bk	B			X				X	D													
	Coal	0.6		Bk	B		X					X	MB	2.9	40.0	50.5	6.6	5.4	75.3	1.3	9.4	2.0	13570	8	2520	Knife-edge fusain partings.
	Fusain	0.1		Ol bk																						Parting. Clayey, with vitrain stringers. Discontinuous.
	Coal	0.2		Bk	B			X				X	MB													
	Fusain	0.05		Ol bk																						Parting. Clayey. Discontinuous.
	Coal	1.1		Bk	B		X					X	MB	2.4	43.8	50.6	3.2	5.7	78.7	1.4	8.1	2.9	14340	7	2260	
	Coal	1.0+		Bk	B		X					X	B	4.3	39.6	48.1	8.0	5.5	72.4	1.3	7.6	5.2	13180	7½	2150	Pyrite abundant.

SITE/STATION NO. 44-24		COUNTY: Clarion		COAL SAMPLE NO(S).: 410731/792125/1A, 410731/792125/1B, 410731/792125/3	
COMPANY: Clyde Miles Coal Co.		LAT. °N: 41°07'31"	ELEV. (base lower coal): 1350'±		
MINE:		LONG. °W: 79°21'25"	TWP.: Limestone		
PERMIT: 509-5		GEOLOGIST: JDI-VWS	15' QUADRANGLE: Clarion	JOINTING: Coal: N65W (face); N40E (butt)	
SAMPLING METHOD: Face channel		DATE: 8-21-74	7 1/2' QUADRANGLE: Strattanville		
REPORTED COAL NAMES: Clarion (A'), Scrubgrass				WEATHERING: Fresh to moderately weathered	

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60%	COAL: VITRAIN ABUNDANCE 30-60%	COAL: VITRAIN ABUNDANCE 15-30%	COAL: VITRAIN ABUNDANCE < 15%	COAL: VITRAIN THICKNESS > 5 mm	COAL: VITRAIN THICKNESS 2-5 mm	COAL: VITRAIN THICKNESS 1/2-2 mm	COAL: Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Clay shale		G	Dk gy to md dk gy																						Siderite nodules common.
4.3	Carbonaceous clay shale		S	Gy bk																						Sulfurous. Plant fragments common.
3.8	Sandstone		U	Vy lt gy																						Mostly planar bedded, with a few channel cut-and-fills; fine grained. Plant fragments common.
2.0	Clay shale		S	Md gy																						Siderite nodules rare.
1.5	Coal		S	Bk	B			X				X	M-MB	6.4	37.1	52.1	4.4	5.6	73.1	1.3	14.6	1.0	12960	2	2780	Partially weathered.
7.5	Claystone (underclay)		S	Lt gy																						Rootlets common.
2.7	Sandstone		S	Lt gy																						Very fine grained.
3.3	Silty clay shale		G	Md gy																						Deep hematite-limonite staining.
5.0	Siltstone		G	Lt gy																						Clayey. Weathers rusty, hackly.
35.0	Silty clay shale		S	Lt gy																						Siderite nodules abundant. Plant fossils (*Neuropteris*, frequent; *Lepidophylloides*, frequent).
4.6+	Coal	0.3		Bk	B		X			X	X	X	M-MD	1.6	35.1	40.7	22.6	4.7	61.8	1.0	6.4	3.5	11290	5	2380	Knife-edge clay partings frequent.
	Coal	2.2		Bk	B			X				X	M-MD	1.3	39.7	46.3	12.7	4.9	71.0	1.1	5.4	4.9	12890	7	2040	Pyrite common.
	Coal	2.1+		Bk	B			X				X	MD													Bony. Pyrite abundant.

SITE/STATION NO.	44-25	COUNTY:	Clarion		COAL SAMPLE NO(S).: 410520/792903/2A,
COMPANY:	Allison Engineering Co.	LAT. °N:	41°05'20"	ELEV. (base lower coal): Appx. 1220'	410520/792903/2B, 410520/792903/7A, 410520/792903/7B
MINE:	Allison #20	LONG. °W:	79°29'03"	TWP.: Toby	
PERMIT:	39-21	GEOLOGIST:	ADG	15' QUADRANGLE: Clarion	JOINTING:
SAMPLING METHOD:	Channel	DATE:	7-23-69	7 1/2' QUADRANGLE: Sligo	
REPORTED COAL NAMES:	Lower Clarion, Upper Clarion				WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0+	Clay shale			Dk gy to bk																						Becomes medium gray toward top. Soil developed on top.
1.7	Coal	0.75	S	Bk	B		X				X	X	M-MD	0.9	40.8	48.3	10.0	5.3	73.7	1.3	6.0	3.7	13460		2140	
	Bone	0.1	S	Bk																						Tough.
	Coal	0.85	S	Bk	B		X				X	X	M-MD	1.1	41.9	48.1	8.9	5.4	75.1	1.5	6.2	2.9	13480		2580	
1.2	Claystone		S	Md dk gy																						Yellowish stain with limonite.
7.0	Sandstone		G	Lt gy																						Fine grained.
5.0	Clay shale		S	Md lt gy																						Abundant invertebrate fossils (Lingula sp.) at base. Thin sandstone lens.
0.9	Black shale		G	Bk																						Silty. Thin coal lenses. Few invertebrate fossils (Lingula sp.).
2.7	Coal	2.0	S	Bk	B		X				X	X	M-MB	1.0	41.3	46.9	10.8	5.3	72.7	1.3	5.6	4.3	13270		2010	
	Bone	0.1	S	Bk																						Tough.
	Coal	0.6	S	Bk	B		X				X	X	M-MB	1.1	36.4	50.3	12.2	4.9	70.7	1.3	5.7	5.2	12880		2010	Pyrite lenses common.
0.4+	Claystone		S	Md lt gy																						Mine floor.

SITE/STATION NO. 44-26	COUNTY: Clarion		COAL SAMPLE NO(S).: 410043/792459/2A, 410043/792459/2B		
COMPANY: Terry Reddinger Coal Co.	LAT. °N: 41°00'43"	ELEV. (base lower coal): Appx. 1420'			
MINE: King Strip	LONG. °W: 79°24'59"	TWP.: Porter			
PERMIT: 314-6	GEOLOGIST: ADG	15' QUADRANGLE: Clarion	JOINTING:		
SAMPLING METHOD: Channel	DATE: 7-23-69	7 1/2' QUADRANGLE: Sligo			
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh		

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
21.0	Siltstone			Md gy																						Grades up to sand-silt laminite at top. Soil above.
1.3	Sandstone		S	Md lt gy																						Medium grained.
1.8	Coal	1.3	S	Bk				X			X	X	M-MD	1.2	40.1	52.7	6.0	5.5	78.1	1.5	6.4	2.5	14070		2080	
	Clay-shale parting	0.1	S	Bk																						
	Coal	0.4	S	Bk			X				X		M-MB	1.5	37.7	52.0	8.8	5.1	74.7	1.6	7.0	2.8	13350		2190	Pyrite lenses common.
0.5+	Claystone		S	Md lt gy																						Slickensides. Mine floor.

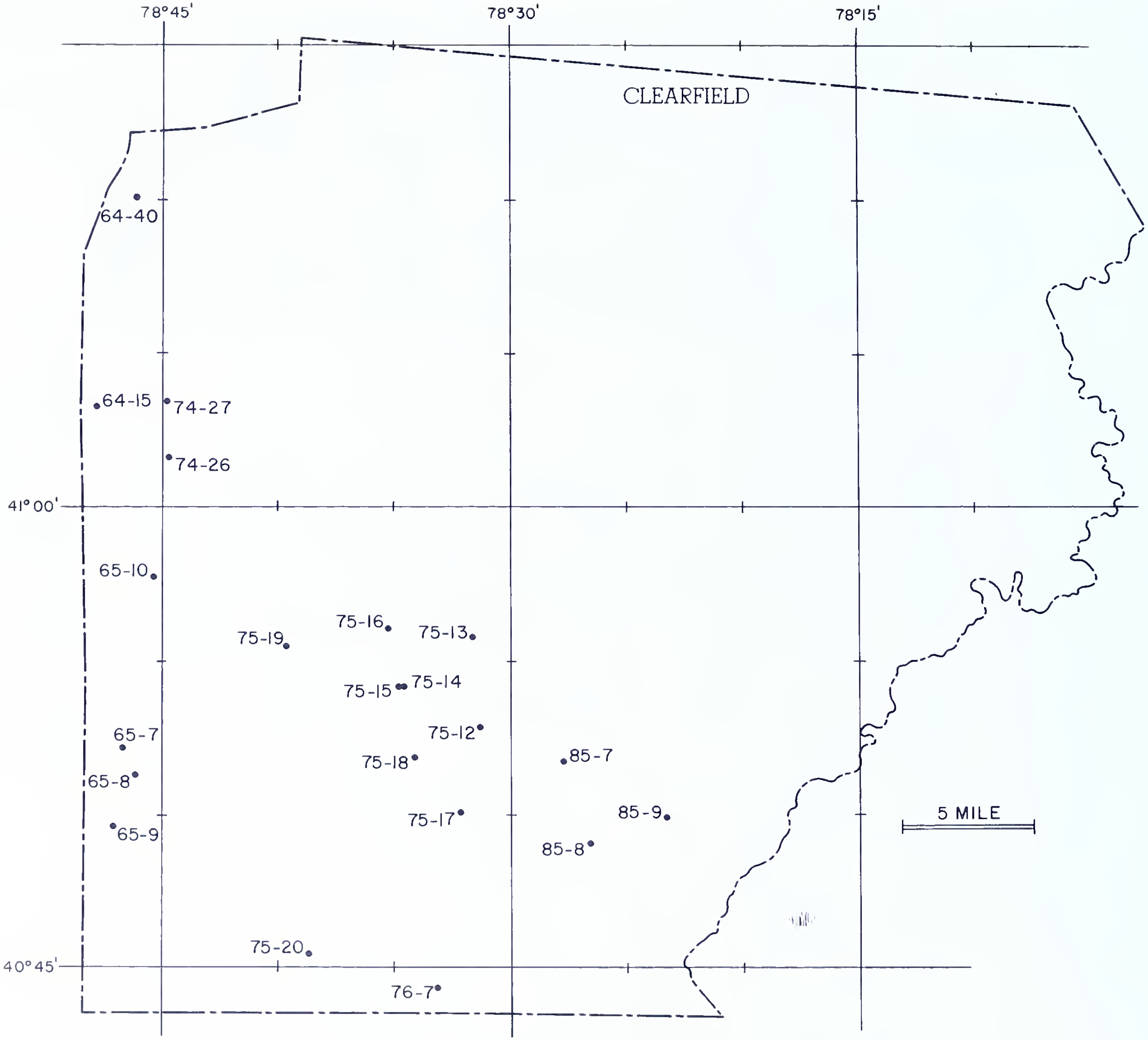
SITE/STATION NO. 53-1
COMPANY: H & G Coal Co.
MINE:
PERMIT: 75-16
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Clarion
LAT. °N: 41°16'54"
LONG. °W: 79°13'49"
GEOLOGIST: ADG
DATE: 9-9-71

ELEV. (base lower coal): Appx. 1680'
TWP.: Millcreek
15' QUADRANGLE: Marienville
7 1/2' QUADRANGLE: Cooksburg

COAL SAMPLE NO(S).: 411654/791349/2B
JOINTING: Coal: N62W, N40E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18.0	Sandstone		S	Mod yls bn, md lt gy																						Soil cover. Fine to very fine grained. Abundant plant fragments in lower part. Thin bedded.
2.5	Clay shale		S	Md lt gy																						Plant fragments and leaves common.
1.0	Sandstone		S	Lt bls gy																						Fine grained. Abundant carbonaceous material on bedding planes.
9.0	Claystone		S	Ol gy																						Plant fragments common. Siderite bands common.
1.9	Coal	1.6	S	Bk	B				X			X	M-MB	4.1	36.3	50.1	9.5	5.4	71.1	1.5	11.6	0.9	12590	2½	2130	Upper 0.3' thin shale partings.
	Bony coal	0.3	S	Bk	B				X			X	M-MD													Rare thin vitrain lenses; this bench not mined.
0.1+	Claystone			Md to md dk gy																						Rootlets and slickensides common. Mine floor.


78°45'
78°30'
78°15'
CLEARFIELD
64-40
64-15
74-27
74-26
41°00'
65-10
75-16
75-13
75-19
75-15
75-14
65-7
75-12
85-7
75-18
65-8
85-9
5 MILE
75-17
65-9
85-8
75-20
40°45'
76-7

SITE/STATION NO.	64-15 (page 1)	COUNTY:	Clearfield			COAL SAMPLE NO(S).:	64-C-6 to 64-C-15
COMPANY:	Pa. Geologic Survey	LAT. °N:	41°03'14"	ELEV. (base lower coal):	Appx. 812'		
MINE:	DuBois Drill Hole #3	LONG. °W:	78°47'51"	TWP.:	Brady		
PERMIT:		GEOLOGIST:	WAB	15' QUADRANGLE:	DuBois	JOINTING:	
SAMPLING METHOD:	Drill Hole	DATE:	4-1-71	7 1/2' QUADRANGLE:	DuBois		
REPORTED COAL NAMES:	Lower Mercer to Upper Freeport					WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0	Calcareous siltstone		S	Gn gy																						Internally homogeneous.
2.1	Silt-clay laminite shale		S	Gn gy																						Subplanar bedding. Siderite zones.
0.7	Silt shale		G	Gn gy																						Subplanar bedding. Siderite zones.
2.1	Silt-clay laminite shale		G	Md to dk gn gy																						Planar bedded. Siderite zone present.
5.1	Silty clay shale		S	Md to md dk gy, gn gy, bl gy																						Planar bedding.
15.0	Clay shale		S	Md dk gy to bk																						Few stem fragments. Color darkens downward. Planar bedding.
1.7	Coal (Upper Freeport)		S	Bk	B		X				X		M	0.8	29.5	64.3	5.4	5.2	81.6	1.5	5.5	0.8	14450	9	2730	Broken. Few thin shale partings.
0.3	Carbonaceous clay shale		S	Vy dk gy to bk																						Coaly lenses.
2.0	Claystone		G	Md dk to md lt gy, md ol gy																						Seat earth, rooted. Soft, plastic.
2.4	Claystone			Dk gn gy, gn gy, md ol gy																						Hard clay. Rooted. Mottled siderite.

SITE/STATION NO. 64-15 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			S																							
1.1	Calcareous siltstone		G	Md gy																						Very hard. Irregular fracture. Mottled siderite.
2.9	Claystone		G	Ol bk, gn gy, bn gy																						Subfissile.
10.3	Claystone		G	Dk to md gy, ol bk, md ol gy																						Seat earth. Semi-hard clay. Mottled siderite.
5.1	Siltstone		G	Md dk gy, md ol gy																						Mottled siderite.
2.9	Silt shale		G	Md to md dk gy, ol bk																						Mottled and layered siderite. Cross laminated.
3.3	Claystone		G	Md gy, ol bk, md ol gy																						Seat earth. Slumped. Soft, plastic.
0.6	Claystone		G	Md dk gy, ol bk, dk ol gy																						Seat earth. Color mottled. Minor internal slumping.
2.6	Sandy siltstone			Md to lt gy, lt bl gy																						Very fine grained sand. Minor mottled siderite.

SITE/STATION NO. 64-15 (page 3)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.3	Claystone		G	Dk to md gy, dk ol gy																						Subfissile. Seat earth.
8.2	Clay shale		G	Md dk gy to bk, dk ol gy																						Abundant plant fossils. Planar bedded.
4.1 ower reeport (Upper plit)	Coal	1.3	S	Bk	B		X				X	X	M	0.6	25.4	50.2	23.8	4.1	62.3	1.1	3.9	4.8	11270	7	2410	Bony toward top. Sulfur stained.
	Carbonaceous clay shale	0.4	S	Bk to vy dk gy																						Subfissile near base.
	Bony coal	0.65	S	Bk	NB				X		X	X	MD	0.5	20.6	38.6	40.3	3.3	48.3	0.9	3.9	3.3	8560	1½	2750	Tough. Calcite flakes and sulfur staining present.
	Coal	0.85	S	Bk	B	X				X	X		MB	0.5	28.5	57.7	13.3	4.7	73.5	1.3	5.3	1.9	13030	9	2460	Abundant calcite flakes.
	Carbonaceous clay shale	0.3	S	Vy dk gy to bk																						Coaly lenses. Subfissile.
	Coal	0.4	S	Bk	B		X				X	X	MB	0.2	28.4	55.6	15.8	4.6	70.8	1.4	4.4	3.0	12630	9	2780	Few thin pyrite partings.
	Carbonaceous clay shale	0.05	S	Vy dk gy to bk																						Few thin coaly lenses.
	Coal	0.15	S	Bk	B		X				X		MB	0.3	28.9	56.6	14.2	4.8	73.0	1.4	4.8	1.8	12990	9	Above 2910	
3.5	Carbonaceous clay shale		S	Vy dk gy to bk																						Plant fossils. Subplanar bedding. Minor sulfur staining.

SITE/STATION NO. 64-15 (page 4)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT °N:	ELEV. (base lower coal):	
MINE:	LONG. °W	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.6 Lower Freeport (Lower Split)	Coal	1.3	S	Bk	B		X				X		MO	0.2	26.7	62.6	10.5	4.7	78.1	1.4	3.8	1.5	13730	7	2830	Few fusain partings.
	Coal	1.5	S	Bk	B		X			X			MB	0.2	29.7	66.0	4.1	5.1	84.1	1.7	4.2	0.8	14710	9	2630	Few fusain partings.
	Coal	1.4	S	Bk	B		X				X		MB	0.3	28.8	65.5	5.4	5.0	82.7	1.6	4.5	0.8	14520	9	Above 2910	Few fusain partings.
	Coal	0.95	S	Bk	B		X			X	X		B	0.3	27.9	65.0	6.8	4.9	81.0	1.5	5.0	0.8	14200	9	Above 2910	Few fusain partings.
	Carbonaceous clay shale		S	Vy dk gy to bk																						Plant fossils. Subfissile.
	Coal	0.35	S	Bk	B		X				X		M	0.6	28.7	61.5	9.2	4.9	77.6	1.5	5.4	1.4	13710	9	Above 2910	Few calcite flakes.
1.0	Claystone		S	Md dk to dk gy, dk ol gy																						Seat earth. Internally slumped. Soft, plastic.
1.0	Silty claystone		G	Ok to md dk gy																						Seat earth. Rooted. Semi-hard clay.
4.2	Clayey siltstone		G	Md to md dk gy																						Internally slumped. Few roots. Minor mottled siderite.
4.9	Silty clay shale		G	Md to dk gy, lt ol gy																						Siderite layers. Subplanar bedding.
0.8	Limestone		G	Ok to md gy, lt ol gy																						Hard, dense. Few siderite zones.

SITE/STATION NO. 64-15 (page 5)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.1	Calcareous claystone		G	Md dk to md gy																						Hard. Internally structureless.
0.9	Limestone		G	Dk gy																						Hard, dense. Irregular fracture.
2.2	Claystone		G	Md dk to dk gy and lt ol gy																						Seat earth. Color mottled. Internally slumped.
1.7	Claystone		G	Md dk to md gy																						Subfissile. Rooted.
5.9	Silt shale		G	Md dk to md gy																						Siderite layers. Subplanar bedding.
5.8	Silty clay shale		G	Md dk to md gy																						Siderite layers and nodules. Planar bedded.
0.4	Carbonaceous clay shale		S	Gy bk to dk gy																						Planar bedded.
2.8 Upper Kittanning	Coal	1.1	S	Bk	B		X				X		M	0.5	27.4	59.2	12.9	4.7	74.7	1.3	3.4	3.0	13270	8	2080	Few thin shale partings.
	Carbonaceous claystone	0.1	S	Vy dk gy to bk																						Vitrain and pyrite lenses.
	Coal	1.6	S	Bk	B		X				X		MB	0.5	27.7	58.6	13.2	4.6	73.8	1.4	4.3	2.7	13170	7½	2130	Calcite flakes. Fusain partings.

SITE/STATION NO. 64-15 (page 6)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.5	Claystone		S	Vy dk to md dk gy, md ol gy																						Seat earth, rooted.
2.4	Calcareous claystone		G	Md to md dk gy																						Internally slumped.
1.7	Claystone		G	Md to md dk gy																						Mottled siderite. Very slightly calcareous.
4.6	Limestone		G	Dk to md lt gy																						Hard, dense. Color mottled.
4.1	Claystone		G	Md to md dk gy																						Semi-hard clay. Internally slumped.
2.2	Claystone		S	Dk to md dk gy																						Mottled siderite. Few roots. Internally slumped.
1.5	Silt-clay laminite shale		G	Md dk to md lt gy																						Subplanar bedding.
3.4	Clay shale		G	Dk to md gy																						Subplanar bedding. Color darkens downward.
1.0	Claystone		G	Md to md dk gy																						Few roots. Semi-hard clay.
1.0	Siltstone		G	Md to md dk gy																						Hard. Irregular fracture.

SITE/STATION NO. 64-15 (page 7)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS										FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND			
					Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm														
1.0	Silt-clay laminite shale		G	Md dk to md lt gy																						Inclined bedding. Minor flaser bedding.
4.8	Silty sandstone		G	Md to md dk gy																						Silt to very fine grained. Subplanar bedding.
4.3	Silt-clay laminite shale		G	Dk to md gy																						Subplanar bedding. Siderite layers.
14.2	Silty clay shale		G	Vy dk to md dk gy																						Plant fossils. Planar bedding. Siderite nodules.
8.8	Sand-silt laminite shale		G	Md dk to dk gy, md lt to lt gy																						Plant fossils. Subplanar bedding. Siderite nodules.
15.4	Silt shale		G	Dk to md lt gy																						Plant fossils. Planar bedding. Siderite nodules.
3.8	Silty clay shale		G	Vy dk to dk gy																						Siderite layers. Planar bedding. Plant fossils.
0.2	Carbonaceous clay shale		G	Vy dk gy to bk																						Coaly lenses common. Irregular laminae.
	Coal	0.4	S	Bk	B			X			X		MD	0.9	20.5	38.8	39.8	3.5	49.8	0.9	5.2	0.8	8750	5	Above 2910	Tough. Few thin black shale partings.
	Coal	1.6	S	Bk	B		X			X	X		M	0.8	26.1	65.2	7.9	4.7	78.6	1.2	3.5	4.1	13970	8	2030	Thin pyrite partings.

SITE/STATION NO. 64-15 (page 8)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	COAL VITRAIN ABUNDANCE > 60%	COAL VITRAIN ABUNDANCE 30-60%	COAL VITRAIN ABUNDANCE 15-30%	COAL VITRAIN ABUNDANCE < 15%	COAL VITRAIN THICKNESS > 5 mm	COAL VITRAIN THICKNESS 2-5mm	COAL VITRAIN THICKNESS 1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.2 Middle Kittanning	Carbonaceous claystone	0.15	S	Vy dk gy to bk																						Rooted.
	Coal	0.5	S	Bk	B		X			X	X		MB	0.8	29.1	64.4	5.7	5.0	81.0	1.4	5.6	1.3	14300	8½	2520	Calcite flakes.
	Pyrite and fusain parting	0.05	S	Bk to vy dk gy																						Unit mostly fused stem fragments.
	Coal	0.5	S	Bk	B		X				X		D	0.9	26.9	59.5	12.7	4.5	73.2	1.2	3.9	4.5	13080	7	2090	Pyrite and calcite flakes.
0.3	Clay shale		S	Bk to vy dk gy																						Plant fossils. Pyrite lenses.
0.5	Calcareous claystone		G	Dk to md dk gy																						Seat earth, rooted.
8.0	Claystone		G	Dk to md gy																						Seat earth, rooted.
2.6	Silty clay shale		G	Dk to md dk gy																						Subplanar laminae.
3.0	Silt shale		G	Vy dk to md dk gy																						Subparallel laminae. Siderite zones.
6.1	Sandy silt shale		G	Vy dk to md gy																						Subplanar bedding. Carbonized plant fossils. Very fine grained sand.
3.9	Silt shale		G	Vy dk to md dk gy																						Subplanar bedding. Coaly lenses.

SITE/STATION NO. 64-15 (page 9)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0	Sand-silt laminite shale		G	Vy dk to md gy																						Plant fragments. Very fine to fine-grained sand.
3.9	Silt shale		G	Vy dk to md dk gy																						Plant fragments common.
22.0	Clay shale		G	Bk to dk gy																						Subplanar bedding. Invertebrate fossils common.
0.2	Silty sandstone		S	Dk to md dk gy																						Subplanar bedding. Silt to very fine grained.
1.7 Lower Kittanning No. 3	Coal	0.65	S	Bk	B		X			X	X		MB	0.7	29.2	60.9	9.2	4.9	78.0	1.2	4.0	2.7	13920	8½	2190	Pyrite flakes near base.
	Pyrite and fusain parting	0.05	S	Bk to vy dk gy																						Unit composed of fused plant fragments.
	Coal	0.3	S	Bk	B		X				X		M	0.6	28.1	58.8	12.5	4.7	75.3	1.2	4.5	1.8	13320	8	2620	Few fusain partings.
	Carbonaceous claystone	.05	S	Bk to gy bk and bn bk																						Few thin coaly lenses.
	Coal	.65	S	Bk	B			X			X		MD	0.8	25.7	51.4	22.1	4.3	65.1	1.1	4.1	3.3	11620	7½	2180	Thin pyrite lenses near base.
7.0	Claystone		S	Dk to md lt gy																						Seat earth. Rooted. Color mottled.

SITE/STATION NO. 64-15 (page 10)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.6	Siltstone		G	Md dk to md lt gy and lt ol gy																						Few organic lenses.
4.0	Sand-silt laminite shale		G	Md dk to md lt gy and gn gy																						Silt to very fine grained. Few siderite-rich zones.
3.9	Clay shale		G	Gy bk to md dk gy																						Siderite zones. Planar bedded.
1.8	Carbonaceous claystone		G	Bk to dk gy																						Minor internal slumping.
1.3 Lower Kittanning No. 1	Coal	0.5	S	Bk	B		X				X		MB	0.5	22.9	39.2	37.4	3.5	52.5	0.9	2.8	2.9	9290	7	2630	Calcite flakes. Few thin sandy lenses near top.
	Carbonaceous claystone	0.15	S	Bk																						Few thin fusain and vitrain lenses. Tough, hard.
	Coal	0.2	S	Bk	B		X				X		MB	0.6	28.6	52.2	18.6	4.5	69.2	1.2	4.0	2.5	12350	8½	2200	Calcite flakes common. Few pyrite lenses.
	Siderite nodule	0.15	S	Dk gy																						Very hard.
	Coal	0.3	S	Bk	B			X			X		MB	0.9	27.5	50.4	21.2	4.2	63.9	1.0	3.8	5.9	11610	8½	2030	Calcite flakes. Internally slumped.
15.3	Claystone		S	Dk to md gy, gn gy																						Semi-hard clay. Seat earth, rooted.

SITE/STATION NO. 64-15 (page 11)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.2	Silt-clay laminite shale		G	Gn gy to lt gn gy																						
1.1	Silt shale		G	Gn gy																						Subplanar bedding.
17.7	Sand-silt laminite shale		G	Lt to dk gy, gn gy																						Few broken plant fossils.
22.8	Sandstone		G	Vy lt to md lt gy, lt bn gy																						Very fine sand to granules. Crossbedded. Thin coaly lenses. Grain size varies rapidly throughout.
1.3	Coal (Clarion)		S	Bk	B		X			X	X		MB	0.9	28.7	46.0	24.4	4.0	59.2	0.9	1.7	9.3	10980	8	2100	Few thin black shale partings.
9.6	Silty clay shale		S	Vy dk to dk gy																						Plant fossils. Planar bedded.
2.2	Claystone		S	Md dk to dk gy																						Few roots.
2.7	Siltstone		G	Md dk to dk gy																						Few roots.
9.9	Sand-silt laminite shale		G	Md dk to md gy																						Subplanar bedding. Broken plant fossils.
4.7	Sandstone		G	Md lt to lt gy																						Fine to medium grained. Few silty laminae. Broken plant fossils.

SITE/STATION NO. 64-15 (page 12)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Bonded(B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.6	Sand-silt laminite shale		G	Dk to md lt gy																						Very fine grained. Inclined beds. Broken plant fossils.
25.6	Sandstone		G	Lt to md lt gy, dk ol gy																						Very fine to very coarse grained. Coaly stringers. Impure. Inclined beds. Coarser near base.
1.5	Sand-silt laminite shale		S	Md dk and md lt gy																						Very fine to fine-grained sand. Broken plant fossils.
0.3	Silt shale		S	Md dk gy																						Planar bedding. Subfissile.
1.5 Upper Mercer (Upper Split)	Coal	.45	S	Bk	B			X				X	D	0.7	21.1	31.8	46.4	3.1	42.2	0.6	4.8	2.9	7550	1	Above 2910	Very bony, with few shale partings.
	Coal	.25	S	Bk	B			X			X		MD	0.6	27.4	56.5	15.5	4.5	71.3	1.0	2.4	5.3	12770	5½	2130	Tough.
	Coal	0.8	S	Bk	B		X			X	X		MD	0.6	24.7	51.3	23.4	4.0	63.9	0.9	2.8	5.0	11420	4½	2350	Tough. Few shale partings.
8.1	Claystone		S	Vy dk to md dk gy																						Seat earth, rooted.
0.3	Coal (Upper Mercer) (lens)		S	Bk	B		X				X		MB	0.7	28.1	52.1	19.1	4.5	67.5	1.0	3.8	4.1	12010	8½	2560	Few thin shale partings.
10.6	Siltstone		S	Vy dk to md dk gy																						Rooted. Internally slumped.

SITE/STATION NO. 64-15 (page 13)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.7	Sandy silt shale		S	Md gy to md dk gy																						Few rootlets.
1.0	Silt shale		S	Dk to md dk gy																						Lensoidal laminae. Plant fragments.
1.7	Sandstone		S	Md lt to lt gy																						Very fine to fine grained. Plant fossils.
1.5	Silt shale		S	Dk to md dk gy																						Plant fragments. Planar bedded. Sideritic layers.
4.5	Clay shale		G	Bk to dk gy																						Few coalified plant stems near base. Planar bedded. Sideritic layers.
1.3 Upper Mercer (Lower Split)	Coal	0.1	S	Bk	B				X		X	X	MB	0.6	25.0	49.0	25.4	3.9	61.1	0.8	2.3	6.5	10980	5	2090	Few sulfur stains.
	Carbonaceous clay shale	0.1	S	Bk to vy dk gy																						Few thin vitrain lenses.
	Coal	0.55	S	Bk	B		X				X		B	0.7	29.1	54.6	15.6	4.5	71.5	1.0	3.0	4.4	12740	7½	2080	Sulfur streaks present.
	Carbonaceous clay shale	0.2	S	Bk to vy dk gy																						
	Coal	0.2	S	Bk	B			X			X		MD	0.5	26.2	49.4	23.9	4.3	65.5	1.0	3.6	1.7	11530	5½	Above 2910	Tough.
	Coal	0.15	S	Bk	B			X			X	X	D	0.5	25.4	47.2	26.9	4.1	62.0	1.0	3.8	2.2	11000	5	Above 2910	Very tough.

SITE/STATION NO. 64-15 (page 14)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.7	Clay shale		S	Vy dk to md dk gy																						Plant fossils. Pyrite nodules.
0.2	Silt shale		S	Dk to md dk gy																						Plant fossils.
18.7	Sandstone		S	Vy lt to md lt gy																						Coaly lenses. Very fine to coarse grained.
2.8	Claystone		S	Md dk to md gy, dk ol gy																						Seat earth. Rooted. Internally slumped.
1.4	Silty claystone		G	Dk ol gy																						Seat earth. Internally slumped.
2.7	Claystone		S	Dk ol gy																						Seat earth. Internally slumped.
1.9	Sandstone		G	Md to vy lt gy																						Very fine to fine grained.
4.8	Carbonaceous clayey silt shale		S	Bk to dk gy																						Few roots and plant fossils. Irregular laminae.
0.4	Coal (Lower Mercer)		S	Bk	B			X			X		MB	0.5	32.2	48.0	19.3	4.6	67.1	0.9	2.3	5.8	12160	7½	2250	Few shaly partings.
0.5	Carbonaceous clay shale		G	Bk to vy dk gy																						Few thin coaly lenses.

SITE/STATION NO. 64-15 (page 15)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.3	Sandstone		G	Dk gy, lt gy, bn gy																						Very fine to fine grained. Few stem fragments.
0.7	Claystone		G	Dk ol gy																						Seat earth. Few oolites.

SITE/STATION NO. 64-40 (page 1)
COUNTY: Clearfield
COAL SAMPLE NO(S).:
COMPANY: Pa. Geological Survey
LAT. °N: 41°10'15"
ELEV. (base lower coal): Appx. 1717'
MINE: DuBois Drill Hole #5
LONG. °W: 78°46'10"
TWP.: Sandy
PERMIT:
GEOLOGIST: ADG
15' QUADRANGLE: DuBois
JOINTING:
SAMPLING METHOD: Core samples
DATE: 4-9-73
7 1/2' QUADRANGLE: Falls Creek
REPORTED COAL NAMES: Mercer
WEATHERING: Fresh

NOTE: REMAINDER OF CORE DESCRIPTION AVAILABLE FROM PA. GEOLOGICAL SURVEY FILES.

STRATIGRAPHIC DATA														COAL ANALYSIS											
					COAL									PROXIMATE (%)				ULTIMATE (%)							
						VITRAIN																			
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.4	Silty sandstone		S	Md lt to lt gy																						Silt laminae common, very fine grained.
0.4	Silt shale		G	Md to md lt gy																						Noncalcareous.
5.9	Silty sandstone		S	Md lt to lt gy																						Very fine to fine grained; silt laminae common.
18.6	Sandstone		S	Md to md lt gy, md bn gy																						Minor silt laminae, fine to medium grained.
2.9	Silt shale		S	Gn gy, md dk gy																						Upper 1.5' greenish gray.
8.45	Sandy silt shale		S	Dk to md lt gy																						Plant fragments rare; plant hash common.
0.45	Coaly shale		S	Bk to gy bk																						Plant fragments abundant; few pyrite streaks and nodules.
2.0	Claystone		G	Md dk gy, dk gn gy																						Hard plastic clay; rootlets and carbonized plant fragments abundant.
4.0	Silt shale			Dk to md dk gy																						Carbonized plant fragments abundant; few siderite bands to 1" thick near top.

SITE/STATION NO. 64-40 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.6	Sand-silt laminite		G	Dk to md dk gy, md lt to lt gy																						Carbonized plant fragments common; sand is lighter in color.
1.3	Silty clay shale		G	Dk to md dk gy																						Carbonized plant fragments common.
2.05	Clay shale		G	Gy bk to md dk gy																						Carbonized plant fragments abundant, darker near base.
0.1	Coaly shale		S	Bk to gy bk																						Coaly partings up to 1/16" thick common.
0.65	Coal		S	Bk	B			X			X	X	D-MD	1.2	32.8	56.3	9.7	5.1	76.8	1.2	6.3	0.9	13670	8	-	Few calcite flakes, minor sulfur staining.
0.2	Carbonaceous clay shale		S	Bk to gy bk																						Carbonized plant fragments abundant.
1.0	Clay shale		S	Dk to md dk gy																						Carbonized plant fragments common.
0.4	Claystone		G	Md dk gy																						Carbonized plant fragments common; siderite nodules rare.
0.7	Silty claystone		G	Md dk gy																						Carbonized plant fragments common; siderite bands rare.
0.1	Zone of coalified plant fragments and clay		S	Bk																						

SITE/STATION NO. 64-40 (page 3)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Claroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.3	Clay shale		S	Gy bk to md dk gy																						Carbonized plant fragments common; darker toward base.
0.65	Shaly coal		G	Bk to gy bk	B				X		X	X	D-MD	1.1	22.3	34.2	42.4	3.4	46.9	0.8	5.9	0.6	8270	3	-	Few calcite flakes; minor sulfur staining.
0.15	Carbonaceous clay shale		S	Bk to gy bk																						Carbonized plant fragments abundant.
0.8	Claystone		S	Dk to md dk gy																						Plastic; rootlets and carbonized plant fragments common.
1.8	Silty claystone		S	Md dk to md gy, bn gy																						Rootlets and carbonized plant fragments common.
0.8	Silty claystone		G	Gy bk to md dk gy																						Carbonized plant fragments common; pyrite nodules common.
0.2	Carbonaceous claystone		S	Bk to dk gy																						Few carbonized plant fragments; pyrite nodules common.
0.05	Coal		S	Bk to gy bk	B			X			X	X	MD-M													
0.05	Carbonaceous clay shale		S	Bk to gy bk																						Carbonized plant fragments and coaly streaks rare.
0.4	Clay shale		S	Gy bk to dk gy																						Abundant carbonized plant stems.

SITE/STATION NO. 64-40 (page 4)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA — COAL ANALYSIS

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60%	COAL: VITRAIN ABUNDANCE 30-60%	COAL: VITRAIN ABUNDANCE 15-30%	COAL: VITRAIN ABUNDANCE < 15%	COAL: VITRAIN THICKNESS > 5 mm	COAL: VITRAIN THICKNESS 2-5 mm	COAL: VITRAIN THICKNESS 1/2-2 mm	COAL: Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.7	Claystone		G	Dk to md dk gy, ol gy																						Hard, plastic; rootlets and carbonized plant fragments common; slickensides near top.
2.3	Silty claystone		G	Ol gy																						Hard; carbonized rootlets rare.
12.1	Clay shale		G	Dk to md dk gy																						Sideritic zones ¼" - 3" thick common; few rootlets near top; possible fossil shell hash near base.
0.6	Clayey silt shale		G	Gy bk to dk gy																						Coaly partings near base; moderate mica.
0.9	Shaly coal		G	Bk to gy bk	B				X		X	X	MB-B	1.2	24.8	43.8	30.2	3.6	56.0	0.8	3.0	6.4	9940	1½	2200	Shale partings up to ¼" common; sulfur partings common near top.
0.15	Silty claystone		S	Gy bk																						Carbonaceous; homogeneous; slickensides.
0.75	Coal		S	Bk to gy bk	B			X			X	X	B-MB	1.1	28.0	38.6	32.3	3.9	53.4	0.8	6.5	3.1	9630	5		Few pyrite and carbonaceous clay shale partings.

SITE/STATION NO. 65-7	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405215/784643
COMPANY: Homer City Coal Co.	LAT. °N: 40°52'12"	ELEV. (base lower coal): Appx. 1370'	
MINE:	LONG. °W: 78°46'44"	TWP.: Bell	
PERMIT: 38-6	GEOLOGIST: WAB	15' QUADRANGLE: Punxsutawney	JOINTING: Coal: N1W, N55W, N20W, N84W, N28E
SAMPLING METHOD: Channel	DATE: 8-19-71	7 1/2' QUADRANGLE: Burnside	Clay shale: N31W
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Carbonaceous clay shale		S	Md dk gy to bk																						Invertebrate fossils (*Lingula* sp.) present (rare). One pyritized plant stem noted. Platy fracture.
1.6	Coal		S	Bk	B			X			X	X	D-MD	0.8	25.2	55.1	18.9	4.3	68.1	1.1	4.2	3.4	12140	8½	2590	0.1' clay parting 0.4' from base. Hard, tough.
-	Carbonaceous claystone			Dk gy to gy bk																						Mine floor. Underclay.

SITE/STATION NO. 65-8	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405127/784601
COMPANY: Hamlin Coal Co.	LAT. °N: 40°51'19"	ELEV. (base lower coal): Appx. 1500'	
MINE:	LONG. °W: 78°46'03"	TWP.: Bell	
PERMIT: 536-1	GEOLOGIST: WAB	15' QUADRANGLE: Punxsutawney	JOINTING: Coal: N85W, N10E
SAMPLING METHOD: Channel	DATE: 8-19-71	7 1/2' QUADRANGLE: Burnside	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Silt shale, siltstone		S	Ol gy																						Parallel to slightly lenticular laminae where present.
9.1	Sandstone		S	Lt bl gy, lt gy																						Silt- to medium-sand-sized grains. Slightly calcareous. Festoon crossbedding.
5.9	Clay shale		S	Md gy to md dk gy, bn gy																						Few plant fragments. Color lightens upward.
2.0	Coal		S	Bk	B	X					X		B, MB, M	2.6	29.0	60.2	8.2	4.9	78.1	1.4	5.0	2.4	13850	9	2160	
-	Claystone			Md dk gy																						Mine floor. Underclay. Rooted.

SITE/STATION NO. 65-9	COUNTY: Clearfield		COAL SAMPLE NO(S).: 404940/784705
COMPANY: Selected Fuels Inc.	LAT. °N: 40°49'39"	ELEV. (base lower coal): Appx. 1340'	
MINE:	LONG. °W: 78°47'05"	TWP.: Burnside	
PERMIT: 466-3	GEOLOGIST: WAB	15' QUADRANGLE: Punxsutawney	JOINTING: Coal: N19W, N80W, N80E
SAMPLING METHOD: Channel	DATE: 8-19-71	7 1/2' QUADRANGLE: Burnside	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sandstone		U	Lt ol gy, md gy, lt gn gy																						Very fine to medium grained. Festoon crossbedding. Plant fossils.
12.3	Silty sandstone		S	Lt gn gy to md gy to md lt gy																						Very fine to fine grained. Plant fossils abundant.
0.1	Silty shale with coaly lenses		S	Md dk gy to bn gy																						Few plant fragments and coaly lenses.
2.1	Coal		S	Bk	B		X			X	X		MD, M, B	1.2	27.2	62.0	9.6	4.8	78.2	1.2	4.2	2.0	13770	8½	2460	Numerous thin nonpersistent carbonaceous clay shale layers.
1.0+	Claystone			Md dk gy																						Mine floor. Underclay. Rooted. Semi-hard.

SITE/STATION NO. 65-10 (page 1)
COMPANY: Benjamin Coal Co.
MINE: Benjamin No. 4
PERMIT: 64-13
SAMPLING METHOD: Channel
REPORTED COAL NAMES: "D", "D rider", "E"

COUNTY: Clearfield
LAT. °N: 40°57'48"
LONG. °W: 78°45'26"
GEOLOGIST: TMB
DATE: 8-25-69

ELEV. (base lower coal): Appx. 2060'
TWP.: Bell
15' QUADRANGLE: Punxsutawney
7 1/2' QUADRANGLE: McGees Mills

COAL SAMPLE NO(S).: 405748/784526/A, B, C
405748/784526/A', B', C'; A", B", C"
JOINTING:
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS													
						VITRAIN							PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod.-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.5	Clay		G	Yls gy																						
5.5	Claystone		S	Dusky yl																						Chippy, hackly.
7.0	Sandstone		S	Dusky yl																						Slabby; very fine grained; micaceous; ripples.
0.4	Coaly clay shale		S	Gys bk																						Chippy; 0.2' claystone in middle.
13.0	Claystone		S	Dusky yl																						Hackly, rubbly.
13.0	Sandstone		G	Pale ol																						Slabby, blocky; very fine grained; ripples; limonite concretions.
2.5	Silt shale		G	Pale ol																						Chippy, rubbly; micaceous.
13.0	Silty clay shale		G	Md dk gy																						Chippy.
1.0	Clay shale		G	Dk gy																						Chippy.
18.0	Silty clay shale		S	Md dk gy																						Chippy; hematite nodules.
3.65	Coal	0.9		Bk	B	X					X	X	M-MB	0.7	30.7	60.3	8.3	5.0	77.5	1.5	3.4	4.3	13900	9	2080	Splintery fracture; fusain at base; top "E" coal.
	Coal	1.5		Bk	B	X					X	X	M-MB	0.9	29.4	58.5	11.2	4.9	75.9	1.5	5.2	1.3	13490	8½	2680	Splintery to rough fracture.
	Bone coal	0.15		Bk	M																					Parting.
	Coal	1.1		Bk	B	X	X				X	X	D-MD	0.5	29.2	53.4	16.9	4.6	69.9	1.4	2.2	5.0	12630	7½	2080	Blocky to splintery fracture; bony near base.

SITE/STATION NO. 65-10 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS													
						VITRAIN							PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.7	Claystone		S	Md dk gy																						Subfissile; chippy, hackly.
2.8	Coal	0.8	S	Bk	B	X					X	X	D	0.8	27.5	45.7	26.0	3.9	59.0	1.1	2.2	7.8	10700	7½	2140	Cubic fracture; top "D rider" coal.
	Bone coal	0.2		Bk	M																					
	Coal	0.3		Bk	B		X				X	X	D	0.8	26.5	45.6	27.1	4.0	59.2	1.1	3.9	4.7	10610	7	2630	Blocky fracture; common knife-edge pyrite partings.
	Clay shale	0.5	S	Gys bk																						Parting.
	Coal	1.0	S	Bk	B		X				X	X	M-MD	0.9	26.1	50.3	22.7	4.1	63.6	1.1	4.0	4.5	11270	7	2580	Cubic to rough fracture; few fusain partings.
9.0	Limestone		S	Md gy																						Micritic; massive, blocky; some claystone lenses.
3.0	Claystone		G	Md dk gy																						Hackly, rubbly.
4.6	Bone coal	0.4	S	Bk	M																					Top "D" coal.
	Claystone	0.8	S	Md dk gy																						Parting; few rootlets.
	Coal	1.9	S	Bk	B		X				X	X	D-MD	0.7	29.6	61.6	8.1	5.0	79.0	1.5	3.7	2.7	13930	8	2030	Blocky fracture; pyrite at base.
	Coal	0.8		Bk	B	X					X	X	M-MB	0.9	29.4	61.8	7.9	5.0	78.8	1.4	4.4	2.5	13980	9	2190	Splintery to blocky fracture; some fusain partings.
	Coal	0.7		Bk	B	X					X	X	M-MB	0.7	28.8	58.7	11.8	4.8	74.6	1.4	3.7	3.7	13280	9	2140	Splintery fracture.
2.0+	Underclay		S	Md dk gy																						Rootlets.

SITE/STATION NO. 74-26
COMPANY: Benjamin Coal Co.
MINE:
PERMIT: 64-43
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning?

COUNTY: Clearfield
LAT. °N: 41°01'38"
LONG. °W: 78°44'47"
GEOLOGIST: WAB
DATE: 7-28-71

ELEV. (base lower coal): Appx. 1590'
TWP.: Brady
15' QUADRANGLE: Penfield
7 1/2' QUADRANGLE: Luthersburg

COAL SAMPLE NO(S).: 410143/784446
JOINTING: Coal: N75W, N8E; silty clay shale: N16W; sandstone: N50E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Sandstone		G	Md gy to lt gy																						Very fine to medium grained. Plant fossils. Planar bedding in lower 6.0'. Upper 9.0' planar crossbedding.
4.2	Silt shale		G	Md dk gy																						Few invertebrate fossils. Few plant fossils. Subplanar laminae.
19.5	Silty clay shale		S	Md dk gy																						Few invertebrate fossils. Subplanar laminae.
3.1	Coal		S	Bk	B		X			X	X		B-MB	1.0	27.1	56.4	15.5	4.6	71.9	1.2	4.5	2.3	12760	8½	2450	Few thin nonpersistent clay shale layers. Few pyrite lenses.
-	Claystone			Md dk gy to dk gy																						Mine floor. Underclay.

SITE/STATION NO. 74-27 (page 1)
COMPANY: Pa. Geologic Survey No. 2 Hole
MINE:
PERMIT:
SAMPLING METHOD: Drill core samples
REPORTED COAL NAMES: Lower Kittanning, Clarion, Mercer
COUNTY: Clearfield
LAT. °N: 41°03'31"
LONG. °W: 78°44'50"
GEOLOGIST: WAB-ADG
DATE: 1-20-71
ELEV. (base lower coal): Appx. 1294'
TWP.: Brady
15' QUADRANGLE: Penfield
7 1/2' QUADRANGLE: Luthersburg
COAL SAMPLE NO(S).: 74-C-33 through 74-C-36
JOINTING:
WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE >60%	30-60%	15-30%	<15%	VITRAIN THICKNESS >5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19.5	Surface material																									
0.6	Silt shale		S	Md to md lt gy																						Unit resistant, does not fracture easily.
0.1	Silt shale		S	Ol gy to dk yls or.																						Weathered zone. Limonite staining. Platy.
0.9	Siltstone		S	Md dk gy																						Cross laminated. Several possible plant fragments.
1.0	Silty clay shale		G	Md dk to dk gy																						Broken plant fragments (mostly stems).
8.2	Silty clay shale		G	Dk to md gy																						Siderite bands to 0.4' thick common.
11.0	Clay shale		G	Bk to dk gy																						Siderite bands common in upper 4'. Invertebrate fossils (Lingula sp. and phosphatic shell fragments) common to abundant.
0.9	Clay shale			Bk to gys bk																						Plant stems common. White and yellow sulfur oxide staining on outside of core.

SITE/STATION NO. 74-27 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Cloroin-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.7 Lower Kittanning No. 3	Coal	0.2	S	Bk	B			X				X	D-MD	0.7	19.5	34.7	45.1	3.2	44.7	0.8	4.8	1.4	7790	3	-	Tough. Platy.
	Coal	1.0	S	Bk	B			X			X		M-MD	0.5	28.9	60.6	10.0	5.0	78.3	1.4	3.2	2.1	13770	7½	2480	
	Clay shale	.02	S	Bk																						Bony, platy. Analysis included with bench below.
	Coal	1.23	S	Bk	B		X				X		M-MB	0.7	28.3	59.3	11.7	4.8	75.6	1.3	3.9	2.7	13450	8½	2120	White sulfur staining.
	Clay shale	.05	S	Bk																						Tough. Coaly streaks. Analysis included with bench below.
	Coal	0.2	S	Bk	B		X				X		M-MB	0.7	27.8	56.8	14.7	4.6	71.3	1.2	3.1	5.1	12760	8½	2120	Pyrite common.
5.9	Claystone		S	Md lt to vy lt gy and lt ol gy																						Rootlets and slickensides common. Underclay.
1.6	Claystone		G	Md to md lt gy																						Few plant fragments. Semi-hard clay.
9.6	Silt-clay laminite shale		G	Md dk to md lt gy, md ol gy																						Crenulated silt and clay laminations common. Rare rootlets.

SITE/STATION NO. 74-27 (page 3)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.1	Clay shale		G	Gys bk to md dk gy and lt ol bk																						Pyrite veinlets and patches common. Few thin sand lenses present. Slickensides.
0.6	Coal (Lower Kittanning No. 1)		S	Bk	B		X				X	X	M-MB	0.5	27.8	57.9	13.8	4.7	74.1	1.2	3.8	2.4	13210	7½	2530	Few thin clay shale partings. Bony at base. White sulfur lenses present.
4.8	Claystone		S	Dk to md gy, ol gy to lt ol bk																						Abundant roots. Coalified plant fragments in upper 0.3'
5.3	Siltstone		G	Md lt to md dk gy to lt ol gy																						Mottled siderite zones abundant near middle of unit.
3.4	Silt shale		G	Md to lt gy and lt ol gy																						Siderite patches and lenses <2" thick common. Sand lenses present.
0.5	Sandstone		S	Md lt to lt gy																						Fine to very fine grained. Siderite beds to ½" thick common.
1.0	Sand-silt laminite shale		S	Md dk to vy lt gy																						Fine to very fine grained. Inclined silt-sand laminations.

SITE/STATION NO. 74-27 (page 4)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.6	Sandstone		S	Md lt to vy lt gy																						Fine to very fine grained. Several thin crenulated clay laminae present.
4.5	Sand-silt laminite shale		S	Md dk to vy lt gy																						Mostly inclined silt-sand laminae and lenses.
14.9	Sandstone		S	Md lt to lt gy																						Fine to medium grained. Coalified organic lenses common, more abundant downward.
35.4	Sandstone		G	Md lt to lt gy																						Medium grained. Crossbedded. Coalified organic bands and lenses common.
1.0	Clay shale		S	Dk to md dk gy																						Abundant plant fragments.
8.4	Silt shale		S	Md dk to vy lt gy																						Plant fragments abundant in upper part. Very fine grained sand and silt lenses common.
0.6	Silt-clay laminite shale		G	Dk to md dk gy																						Plant fragments common.
1.7	Coal (Clarion)		S	Bk	B				X			X	M-MD	0.6	22.5	39.9	37.0	3.5	51.0	0.8	5.3	2.4	9020	1	-	Several thin, tough, bony partings.
2.1	Siltstone		S	Bk to dk gy to ol bk																						Abundant plant stems.

SITE/STATION NO. 74-27 (page 5)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.8	Sandstone		S	Md dk to vy lt gy																						Coarse to very fine grained. Abundant coalified plant stems.
.03	Coal (Clarion)		S	Bk	B				X			X	B													White sulfur crystals on upper surface.
22.87	Sandstone		S	Md lt to vy lt gy																						Coarse to very fine grained. Coalified plant stems common. Silt lenses present.
0.5	Silt shale		S	Md dk to md gy																						Thin very fine sand and silt lenses common.
10.1	Sandstone		S	Md lt to vy lt gy																						Very fine to medium grained. Silt stringers <1/32" common. Few silt beds to 1" thick.
0.5	Silt shale		S	Md dk to md gy																						Thin very fine sand and silt lenses common in upper foot.
0.9	Sandstone		S	Md lt to vy lt gy																						Coarse to fine grain size. Becomes coarser downward.
7.4	Silt shale		S	Md dk to md lt gy																						Abundant plant fragments in lower part. Siderite nodules and bands common.
4.4	Silt-clay laminite shale		S	Bk to dk gy																						Rare plant fragments in upper 2'. Siderite nodules and bands common.

SITE/STATION NO. 74-27 (page 6)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.2	Clay shale		G	Bk to gys bk																						Common plant stems, more abundant downward. Pyrite patches common.
4.4 Mercer	Coal	0.6	S	Bk	B				X			X	M-MD	0.5	27.0	53.6	18.9	4.3	68.7	1.0	1.9	5.2	12220	4	2140	Bony at top. Sulfur stains common.
	Claystone	2.8	S	Bk to dk gy																						Abundant carbonized roots. Slickensides very common.
	Coal	0.4	S	Bk	B			X				X	M-MD	0.5	28.0	55.2	16.3	4.2	71.5	1.0	3.6	3.4	12690	7½	2250	Much white sulfur staining.
	Coal	0.35	S	Bk	B		X				X		M-MB	0.5	30.2	58.3	11.0	4.9	76.7	1.1	4.1	2.2	13660	8	2590	Few thin pyrite lenses and white sulfur staining.
	Claystone	0.1	S	Bk to gys bk																						Slightly silty; few very thin coaly lenses.
	Coal	0.15	S	Bk	B				X			X	M-MB	0.5	28.5	51.5	19.5	4.5	68.8	1.1	4.8	1.3	12220	5	-	Tough.
6.1	Claystone		S	Md dk to md gy, md ol gy																						_Stigmaria_ abundant.
9.1	Silt shale		G	Dk to md dk gy																						Plant fragments, leaves, and stems rare in upper part. Siderite nodules and bands common.

SITE/STATION NO. 75-12	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405253/783128/A, 405253/783128/B
COMPANY: Ryan Brothers Coal Co.	LAT. °N: 40°52'53"	ELEV. (base lower coal): Appx. 1725'	
MINE: Buck Run Strip	LONG. °W: 78°31'28"	TWP.: Knox	
PERMIT: 31-4	GEOLOGIST: TMB	15' QUADRANGLE: Curwensville	JOINTING: N83E, vert.; N40W, vert.
SAMPLING METHOD: Channel	DATE: 8-28-69	7 1/2' QUADRANGLE: Curwensville	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
25.0+	Sandstone			Mod gys yl																						Fine to medium grained; micaceous; some laterally discontinuous silt shale beds.
11.0	Clay shale grading up to silt shale		S	Md gy																						Chippy, slabby; micaceous; some sandy beds near top.
0.8	Clay shale		S	Gys bk																						Chippy.
3.0	Clay shale		S	Md dk gy																						Chippy, blocky; common fossil leaves; siderite laminae up to ½".
3.0	Clay shale		G	Dk gy																						Chippy; common fossil leaves; common megaspores at base.
2.2	Coal	1.3	S	Bk	B	X					X	X	M-MB	1.0	24.9	69.8	4.3	5.0	84.2	1.6	4.2	0.7	14790	9	2680	Splintery to rough fracture; ½" fusain at base.
	Coal	0.9		Bk	B	X					X	X	MB-MD	0.9	22.6	61.6	14.9	4.5	74.5	1.4	4.0	0.7	13050	9	2840	Blocky to rough fracture.
1.0+	Underclay		S	Md dk gy																						Hackly, rubbly; rootlets.

SITE/STATION NO.	75-13	COUNTY:	Clearfield			COAL SAMPLE NO(S).:	405545/783139
COMPANY:	Bradford Coal Co., Inc.	LAT. °N:	40°55'45"	ELEV. (base lower coal):	Appx. 1500'		
MINE:	Curwensville #2	LONG. °W:	78°31'39"	TWP.:	Pike		
PERMIT:	61-18	GEOLOGIST:	TMB	15' QUADRANGLE:	Curwensville	JOINTING:	M25W, vert.; N40E, vert.
SAMPLING METHOD:	Channel	DATE:	8-28-69	7 1/2' QUADRANGLE:	Curvensville		
REPORTED COAL NAMES:	Upper Freeport					WEATHERING:	Fairly fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
5.0+	Sandstone			Mod yls gy																						Chippy, slabby; micaceous; very fine grained.
5.0	Silt-clay laminite		G	Md dk gy																						Chippy; micaceous; plant fragments.
3.5	Clay shale		G	Md gy																						Chippy; micaceous and silty upwards; plant fragments and possible invertebrate fossils (conchostracans).
2.0	Bone coal	0.4	S	Bk	B				X		X	X	D													
	Coal	1.6		Bk	B	X					X	X	M-MB	1.1	24.1	64.2	10.6	4.7	77.6	1.5	5.1	0.5	13480	9	Above 2910	Cubic fracture.
0.5+	Underclay		S	Dk yls or.																						Hackly, semi-plastic.

SITE/STATION NO. 75-14	COUNTY: Clearfield			COAL SAMPLE NO(S).: 405410/783438	
COMPANY: Empire Coal Co.	LAT. °N: 40°54'10"	ELEV. (base lower coal): Appx. 1600'			
MINE: Macracken No. 3	LONG. °W: 78°34'38"	TWP.: Ferguson			
PERMIT: 69-10 (Site B)	GEOLOGIST: TMB	15' QUADRANGLE: Curwensville		JOINTING: See 69-10 (Site A), data sheet 75-15	
SAMPLING METHOD: Channel	DATE: 8-28-69	7 1/2' QUADRANGLE: Curwensville			
REPORTED COAL NAMES: Upper Freeport				WEATHERING: Fairly fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
8.0	Clay shale		G	Gys or.																						Chippy.
4.5	Clay shale grading up to silt-clay laminite		G	Md dk gy																						Chippy, slabby; few invertebrate fossils (cyzicoid conchostracans).
1.0	Clay shale		S	Gys bk																						Chippy.
1.0	Coal		S	Bk	B									1.0	24.6	63.5	10.9	4.8	77.2	1.5	4.5	1.1	13550	9	2730	
0.5+	Underclay			Md dk gy																						Hackly, rubbly; common rootlets.

SITE/STATION NO.: 75-15	COUNTY: Clearfield			COAL SAMPLE NO(S).:	405404/783449/A
COMPANY: Empire Coal Co.	LAT. °N: 40°54'04"	ELEV. (base lower coal): Appx. 1520'			405404/783449/B
MINE: Macracken No. 3	LONG. °W: 78°34'49"	TWP.: Ferguson			
PERMIT: 69-10 (Site A)	GEOLOGIST: TMB	15' QUADRANGLE: Curwensville		JOINTING:	N5W, vert.; N85W, vert,; N80E, vert.
SAMPLING METHOD: Channel	DATE: 8-28-69	7 1/2' QUADRANGLE: Curwensville			
REPORTED COAL NAMES: Lower Freeport				WEATHERING:	Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
8.0	Sandstone			Yls gy																						Slabby, blocky.
7.0	Interbedded sandstone and siltstone		G	Mod yls gy																						Chippy, slabby; micaceous; ripples; very fine grained.
4.0	Silt shale with some interbedded sand-silt laminite		S	Md gy																						Chippy, hackly, slabby, micaceous; common plant fragments.
5.0	Clay shale grading up to silt shale		G	Md dk gy																						Chippy, slabby; micaceous; nonmarine invertebrate fossils (Anomalonema); common plant fossils.
1.0	Clay shale		G	Gys bk																						Chippy; carbonaceous.
1.0	Clay shale		S	Md dk gy																						Chippy, slabby.
2.1	Coal	1.1	S	Bk	B	X					X	X	M-MB	0.8	25.8	64.2	9.2	4.8	78.5	1.6	2.6	3.3	13940	9	2090	Fusain and pyrite partings.
	Coal	1.0		Bk	B	X					X	X	B-MB	0.7	26.7	61.8	10.8	4.8	77.7	1.5	3.5	1.7	13640	9	2730	Splintery to blocky fracture; upper 1" bony.
3.0+	Underclay		S	Md dk gy																						Hackly, rubbly; rootlets.

SITE/STATION NO. 75-16
COMPANY: Hepburnia Coal Co., Inc.
MINE: Shane No. 2
PERMIT: 14-16
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Clearfield
LAT. °N: 40°56'05"
LONG. °W: 78°35'20"
GEOLOGIST: TMB
DATE: 8-27-69

ELEV. (base lower coal): Appx. 1450'
TWP.: Lumber City Borough
15' QUADRANGLE: Curwensville
7 1/2' QUADRANGLE: Curwensville

COAL SAMPLE NO(S).: 405605/783520/A; 405605/783520/B; 405605/783520/C
JOINTING: N25W, vert.; N50E, vert.
WEATHERING: Moderately fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
10.0+	Clay shale																									Chippy, blocky, hackly.
0.5	Coaly clay shale		S	Gys bk																						Chippy; vitrain lenses.
2.0	Clay shale		S	Pinkish gy																						Chippy, hackly; abundant plant leaves.
8.0	Sand-silt laminite grading up to sandstone		G	Gys or.																						Slabby, rubbly; micaceous; plant fragments; very fine to fine grained.
10.0	Silt-clay laminite grading up to sand-silt laminite		G	Md gy																						Chippy, slabby.
4.0	Clay shale		G	Md gy																						Chippy, blocky; few small clayey nodules.
2.95	Coal	1.05	S	Bk	B						X	X	D-MD	0.6	22.4	60.9	16.1	4.2	68.8	1.1	-	10.4	12480	9	2010	Splintery to cubic fracture; common knife-edge pyrite partings.
	Bone coal	0.15		Bk																						
	Coal	0.90		Bk	B		X				X	X	D-MD	0.5	23.6	60.6	15.3	4.4	73.0	1.2	2.5	3.6	12970	9	2570	Cubic fracture; common thin pyrite partings.
	Clay shale	0.05																								Parting; chippy; fossil plants.
	Coal	0.80		Bk	B			X			X	X	D	0.5	21.6	54.3	23.6	4.0	64.8	1.0	4.0	2.6	11380	8	Above 2910	Rough fracture; common knife-edge pyrite partings.
0.5+	Underclay		S	Dk gy																						Hackly.

SITE/STATION NO. 75-17	COUNTY: Clearfield		COAL SAMPLE NO(S).: 405005/783211/2	
COMPANY: Empire Coal Co.	LAT. °N: 40°50'05"	ELEV. (base lower coal): Appx. 1810'		
MINE:	LONG. °W: 78°32'11"	TWP.: Jordan		
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Curwensville	JOINTING: Siltstone: N51E, N37W	
SAMPLING METHOD: Channel	DATE: 10-6-70	7 1/2' QUADRANGLE: Irvona		
REPORTED COAL NAMES: Mahoning			WEATHERING: Fresh	

STRATIGRAPHIC DATA															COAL ANALYSIS												
					COAL										PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15+	Siltstone to sand-silt laminite		S	Md gy to md dk gy																						Plant fossils.
1.8	Coal		S	Bk	M N B		X					X	D M	0.7	20.8	56.2	22.3	4.1	67.0	1.3	3.5	1.8	11790	5½	Above 2910	Nonbanded zone 1.2 to 1.4' above base.
0.15	Carbonaceous claystone		G	Bk																						
0.15	Coal		S	Bk	B		X					X	M													Not mined.
-	Claystone																									Mine floor.

SITE/STATION NO. 75-18 (page 1)	COUNTY: Clearfield	COAL SAMPLE NO(S).: 405155/783411/2
COMPANY:	LAT. °N: 40°51'55" ELEV. (base lower coal): Appx. 1560'	
MINE:	LONG. °W: 78°34'11" TWP.: Jordan	
PERMIT:	GEOLOGIST: WEE 15' QUADRANGLE: Curwensville	JOINTING: Sandstone: N52E, N73W, N27W
SAMPLING METHOD: Channel	DATE: 10-6-70 7 1/2' QUADRANGLE: Irvona	
REPORTED COAL NAMES: Lower Freeport		WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS PROXIMATE (%)				ULTIMATE (%)								
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13.5	Sandstone		S	Dusky yl																						Fine grained. Cross-bedded.
7.0	Sandstone		G	Dusky yl																						Very fine to fine grained. Thin bedded.
10.0	Clayey silt shale			Dk gy to ol gy																						
7.5	Cover																									Includes a mined coal.
2.0	Underclay		G	Md gy to md lt gy																						Plant fossils.
4.0	Interbedded limestone and claystone		G	Md gy and md lt gy																						0.5' to 1.0' interbeds.
3.0	Underclay		G	Md lt gy																						
4.0	Clayey, silty sandstone		G	Md lt gy																						Silt to very fine grained. Lumpy, irregular bedding.
6.0	Clayey, silty sandstone		G	Md gy																						Silt to very fine grained. Thin bedded.
4.0	Clayey silt shale		G	Md dk gy to dk gy																						Some siderite nodules.
6.0	Silty clay shale			Md dk gy to dk gy																						Some siderite nodules.

SITE/STATION NO. 75-18 (page 2)
COUNTY:
COAL SAMPLE NO(S):
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.2	Coal		S	Bk	B		X				X	X	M-MB	0.9	25.2	65.2	8.7	4.8	79.7	1.4	3.8	1.6	14030	8½	2720	Several thin shale, fusain, pyrite, and bone partings.
0.3+	Underclay		S	Dk gy																						Plant fossils. Mine floor.

SITE/STATION NO. 75-19
COUNTY: Clearfield
COAL SAMPLE NO(S).: 405529/783943
COMPANY: Shawville Coal Co.
LAT. °N: 40°55'29"
ELEV. (base lower coal): Appx. 1540'
MINE: Bell Run No. 7
LONG. °W: 78°39'43"
TWP.: Greenwood
PERMIT: 30-1
GEOLOGIST: TMB
15' QUADRANGLE: Curwensville
JOINTING: N27W, vert.; N88E, vert.
SAMPLING METHOD: Channel
DATE: 8-21-69
7 1/2' QUADRANGLE: Mahaffey
REPORTED COAL NAMES: Upper Freeport(?)
WEATHERING: Fairly fresh

STRATIGRAPHIC DATA															COAL ANALYSIS													
					COAL										PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																						
						ABUNDANCE				THICKNESS																		
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS		
15.0+	Sandstone		S	Vy lt gy to dusky yl																						Fine grained; flaggy, slabby, blocky; thicker bedded upwards; few hematite nodules; micaceous; plants; potential flagstone.		
13.5	Silt shale grading up to sand-silt laminite		G	Md gy																						Chippy, flaggy; some siderite bands up to ½"; micaceous; common fossil plants; unit thins to the east.		
3.5	Clay shale		S	Md dk gy																						Platy, chippy; slightly silty upwards; few plant fragments.		
2.3	Coal		S	Bk	B	X					X	X	M-MD	0.7	27.6	62.3	9.4	4.9	78.7	1.5	3.7	1.8	13800	9	2520	Uniform -- no obvious benches; common fusain and pyrite partings up to ¼"; some sulfur blooms.		
0.5+	Underclay			Md dk gy																						Hackly; fairly soft; abundant rootlets.		

SITE/STATION NO. 75-20 (page 1)	COUNTY: Clearfield		COAL SAMPLE NO(S).: 404529/783843/2, -/4, -/10, -/12
COMPANY: Benjamin Coal Co.	LAT. °N: 40°45'29"	ELEV. (base lower coal): Appx. 1550'	
MINE: Ben No. 1	LONG. °W: 78°38'43"	TWP.: Chest	
PERMIT: 64-15	GEOLOGIST: GBG	15' QUADRANGLE: Curwensville	JOINTING: Siltstone: N68W, N30E
SAMPLING METHOD: Channel	DATE: 8-13-69	7 1/2' QUADRANGLE: Westover	
REPORTED COAL NAMES: Upper Kittanning, Lower Freeport, Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0	Silt-clay laminite shale		G	Md gy to gn gy																						Very weathered.
0.2	Clay shale		S	Gy bk																						
1.6	Coal		S	Bk	B		X				X	X	M-MB	1.8	25.4	62.9	9.9	4.5	74.8	1.3	8.9	0.6	12940	1½	2910	Weathered. Upper Freeport(?).
3.5	Underclay			Md gy to lt gy																						Plastic.
5.5	Cover																									
11.0	Clay shale		G	Lt ol gy																						Limonitic (weathering).
6.0	Interbedded underclay and clay shale		G	Gn gy																						
6.0	Interbedded siltstone and sandstone		S	Md lt gy to gn gy																						
0-0.5	Claystone		U	Gy bk and lt ol gy																						
2.7	Coal		S	Bk	B		X				X	X	M	1.6	24.4	63.0	11.0	4.5	74.9	1.4	7.6	0.6	12950	1½	2100	Bone and fusain partings.
4.0	Siltstone		G	Md gy																						Plant fossils.
1.0	Silt-clay laminite			Dk gy to md dk gy																						Plant fossils.

SITE/STATION NO. 75-20 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.8	Coal		S	Bk	B		X				X	X	M-MD	0.5	27.3	60.6	11.6	4.7	76.4	1.3	3.7	2.3	13510	9	2550	Lower Freeport(?).
0.8	Claystone		S	Dk gy to md dk gy																						Plant fossils.
3.5	Siltstone		G	Md gy to md lt gy																						Plant fossils.
4.5	Sandstone		G	Md lt gy to gn gy																						Very fine grained.
11.0	Sandstone		S	Lt gy																						Plant fossils. Shale pebbles.
5.0	Sand-silt laminite		S	Md dk gy and md lt gy																						
0.3	Clay shale		S	Gy bk to dk gy																						
1.2	Coal		S	Bk	B			X			X	X	D	0.8	23.7	59.3	16.2	4.4	71.2	1.3	5.8	1.1	12520	6½	2790	Shale partings. Upper Kittanning(?).
2.0	Claystone		S	Md gy to ol gy																						Plant fossils.
14.0	Siltstone		G	Md dk gy to md gy																						Siderite nodules and bands. Massive.
1.4	Coal		S	Bk	B			X			X	X	M-MB	0.8	20.2	45.9	33.1	3.6	55.8	1.0	5.4	1.1	9680	4	2890	Peacock stain. Upper Kittanning (?).
0.3+	Clay shale		S	Gy bk to dk gy																						Plant fossils.

SITE/STATION NO. 76-7
COMPANY:
MINE:
PERMIT: 101-12
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

COUNTY: Clearfield
LAT. °N: 40°44'25"
LONG. °W: 78°33'05"
GEOLOGIST: WAB
DATE: 8-20-71

ELEV. (base lower coal): Appx. 1720'
TWP.: Beccaria
15' QUADRANGLE: Patton
7 1/2' QUADRANGLE: Coalport

COAL SAMPLE NO(S).: 404426/783301
JOINTING: Coal: East-West, N46W, N78E
WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5mm	VITRAIN THICKNESS 1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Silt shale		S	Lt ol gy to lt gn gy																						Horizontal to lenticular laminae.
1.6	Sandstone		S	Md gy to md dk gy																						Very fine to fine grained. Beds and laminae parallel and horizontal.
17.9	Silt shale		S	Md gy to md dk gy																						Plant fragments common. Silt content increases upward.
1.5	Clay shale		S	Md dk gy to gy bk																						Carbonaceous. Few plant fossils. Fracture along vertical joints.
2.3	Coal		S	Bk	B			X			X		M MB B	2.6	24.1	64.0	9.3	4.7	77.1	1.4	5.9	1.6	13710	9	2460	Many persistent, thin, carbonaceous clay shale layers.
-	Carbonaceous claystone			Dk gy to gy bk																						Mine floor. Underclay.

SITE/STATION NO. 85-7	COUNTY: Clearfield			COAL SAMPLE NO(S).: 405143/782746/2A, 405143/782746/2B	
COMPANY: Empire Coal Co.	LAT. °N: 40°51'43"	ELEV. (base lower coal):			
MINE:	LONG. °W: 78°27'46"	TWP.: Knox			
PERMIT: 69-34	GEOLOGIST: MAS-VWS	15' QUADRANGLE: Houtzdale		JOINTING:	
SAMPLING METHOD: Channel face	DATE: 4-26-74	7 1/2' QUADRANGLE: Ramey			
REPORTED COAL NAMES:				WEATHERING: Fresh to weathered	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0-1	Coal																									
8.5	Claystone (underclay)																									
	Sandstone(?)			Md gy																						
1.75	Coal			Bk																						
2.0	Claystone (underclay)																									
4.0	Claystone																									
4.5	Clay shale																									
6.5	Sand-silt laminite		S	Md dk gy																						Irregular, lenticular laminae. Plant fossils common.
1.3	Coal	0.5		Bk	B		X				X	X	M-MB													
	Bone	0.1		Bk																						
	Coal	1.7		Bk	B	X					X	X	M	3.7	22.2	69.2	4.9	4.9	80.6	1.3	7.4	0.9	14060	7	2700	
	Claystone		S																							

SITE/STATION NO. 85-8
COMPANY: N/A
MINE:
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES: Lower Freeport

COUNTY: Clearfield
LAT. °N: 40°49'00"
LONG. °W: 78°26'38"
GEOLOGIST: MAS
DATE: 9-12-74

ELEV. (base lower coal):
TWP.: Bigler
15' QUADRANGLE: Houtzdale
7 1/2' QUADRANGLE: Ramey

COAL SAMPLE NO(S).: Coal too weathered to sample
JOINTING:
WEATHERING: Weathered

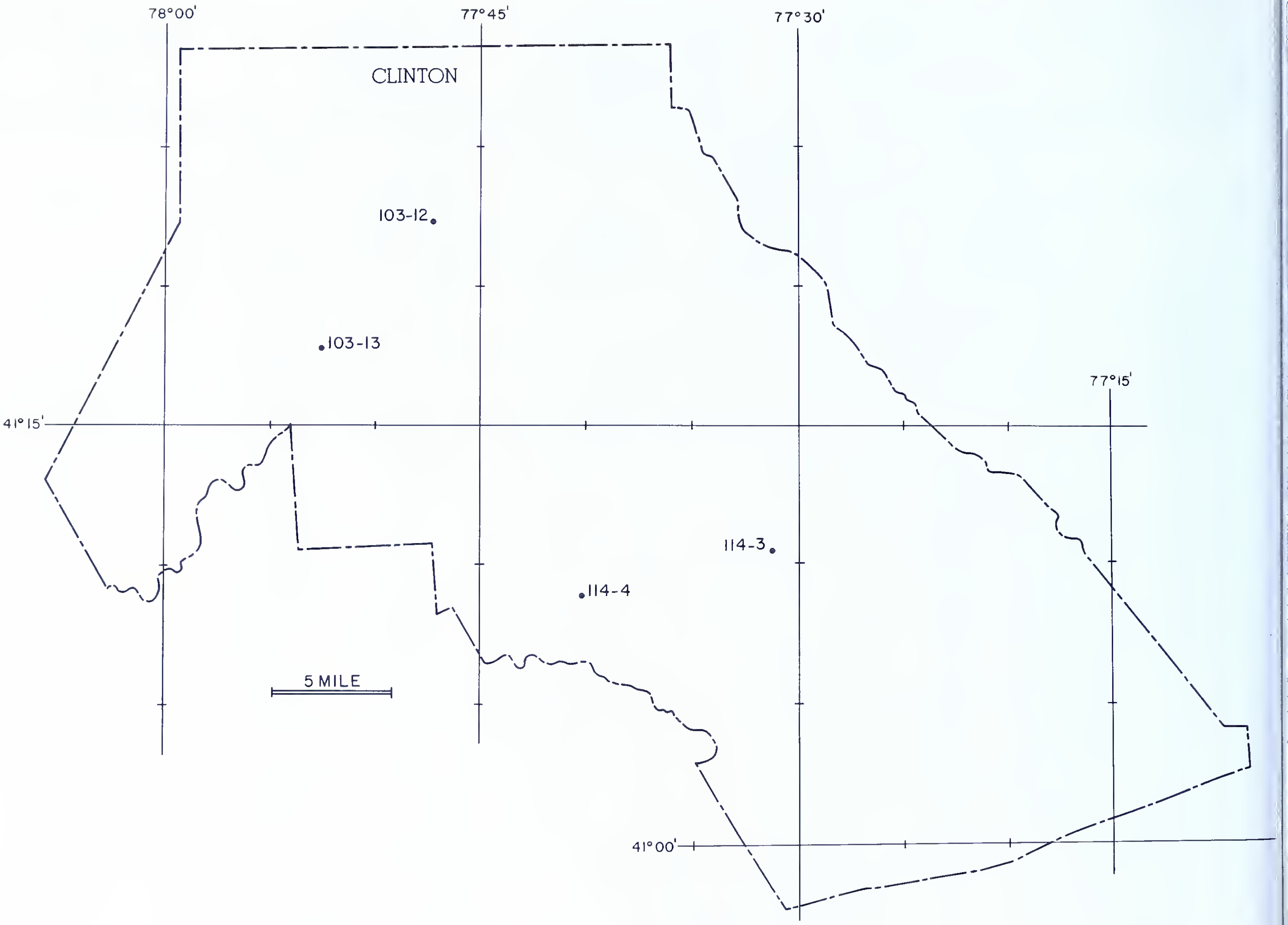
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Cloroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10+	Sandstone		U	Lt gy to lt bn																						Low-angle tabular crossbeds.
2.3	Clay shale		S	Md gy																						
1.1	Coal		S	Bk	B		X				X	X														
5+	Silty shale			Gys bk																						Plant fossils abundant; grades into underclay at top.

SITE/STATION NO. 85-9 (page 1)	COUNTY: Clearfield		COAL SAMPLE NO(S).: 404956/782312/A and B, 404956/782312/C, 404956/782312/D, 404956/782312/E, 404956/782312/F
COMPANY: Flango Bros. Coal Co.	LAT. °N: 40°49'56"	ELEV. (base lower coal):	
MINE:	LONG. °W: 78°23'12"	TWP.: Bigler	
PERMIT: 161-13	GEOLOGIST: VWS-MAS	15' QUADRANGLE: Houtzdale	JOINTING:
SAMPLING METHOD: Channel face	DATE: 4-23-71	7 1/2' QUADRANGLE: Ramey	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Weathered to very weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
21.6	Sandstone	1.5		Lt ol gy																						Mostly covered.
	Claystone	4.0																								Mostly covered.
	Sandstone	3.0		Yl gy																						
	Silty shale	2.5		Dusky yl																						
	Clay shale	7.6	G	Ol gy																						
	Sand-silt laminite	3		Md dk gy																						Calcareous clay nodules.
14	Sandstone	12	G	Lt gy																						Large tabular crossbeds.
	Silt-clay laminite	0.8?	S	Md dk gy																						
	Clay shale	1.0	G	Gy bk																						Leaf fossils rare; pyritic.
	Coaly shale	0.2	G	Bk																						Discontinuous vitrain layers.
7.7	Coal	0.4	G	Bk	B		X				X		D	1.9	20.3	64.3	13.5	4.4	75.0	1.3	5.1	0.7	13120	9	2910+	Thin persistent parting in middle.
	Bone coal	0.05		Bk																						
	Coal	0.3		Bk										1.1	20.5	58.9	19.5	4.2	69.7	1.2	4.4	1.0	12170	9	2910+	
	Bone coal	0.2		Bk																						
	Coal	0.4		Bk	B			X			X		MD	2.7	20.1	64.8	12.4	4.5	75.2	1.4	5.8	0.7	13070	9	2910+	
	Bone coal	0.1		Bk																						
	Coal	0.2		Bk	N								D													

SITE/STATION NO. 85-9 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Shale	0.3		Bk																						
	Coal	0.5		Bk	B		X				X		MD	1.2	23.9	65.1	9.8	4.6	79.0	1.6	4.3	0.7	13750	8½	2910+	
	Parting	0.2		Bk																						
	Coal	1.5		Bk	N								B	1.3	20.4	70.0	8.3	4.6	80.6	1.6	4.3	0.6	13960	8	2910+	Some indistinct vitrain.
	Coal	3.3		Bk	B		X				X		MD	2.6	20.8	73.3	3.3	4.8	84.0	1.6	5.7	0.6	14590	7	2910+	


78°00'
77°45'
77°30'
77°15'
41°15'
41°00'
CLINTON
103-12
103-13
114-3
114-4
5 MILE

SITE/STATION NO.	103-12	COUNTY:	Clinton		
COMPANY:	Carlin Coal Co.	LAT. °N:	41°22'22"	ELEV. (base lower coal):	Appx. 1660'
MINE:	Ridge Strip	LONG. °W:	77°47'04"	TWP.:	Leidy
PERMIT:	134-18	GEOLOGIST:	TMB	15' QUADRANGLE:	Renovo West
SAMPLING METHOD:	Channel	DATE:	8-26-69	7 1/2' QUADRANGLE:	Renovo West

REPORTED COAL NAMES: Lower Kittanning (or Middle Kittanning?)

COAL SAMPLE NO(S).: 412222/774704

JOINTING: N40W, vert.; N55E, vert.

WEATHERING: Fairly fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0-30.0	Sandstone			Lt gy																						Slabby, blocky; medium to coarse grained; coaly plant fragments; micaceous; this unit part of channel complex.
3.0	Underclay		S	Md gy																						Hackly; rootlets; blackish streak at top; this unit deposited in same channel as overlying sandstone.
7.0	Silt shale grading up to siltstone		G	Mod yls gy																						Chippy, slabby, blocky; micaceous.
11.0	Clay shale		G	Md dk gy																						Hackly, rubbly; discontinuous lenses of flint clay and/or bedded siderite. Marine invertebrate fossils include pectinids, _Orbiculoidea_, _Lingula_, and chonetids.
3.0	Bone coal	1.2	S	Bk	M				X		X		D													Discarded in mining; many coaly clay shale partings.
	Coal	1.8		Bk	B	X					X	X	M-MB	0.8	23.7	68.6	6.9	4.6	80.3	1.3	1.9	5.0	14170	9	2350	Splintery to rough fracture; common knife-edge pyrite partings and some pyrite lenses up to ½".
0.5+	Underclay		S	Md dk gy																						Rootlets.

SITE/STATION NO.	103-13 (page 1)	COUNTY:	Clinton	COAL SAMPLE NO(S).:	411746/775229/A, B, C, D
COMPANY:	Kettle Creek Corporation	LAT. °N:	41°17'46"	ELEV. (base lower coal):	Appx. 1465'
MINE:	Bitumen	LONG. °W:	77°52'29"	TWP.:	Noyes
PERMIT:	447-7	GEOLOGIST:	TMB	15' QUADRANGLE:	Renovo West
SAMPLING METHOD:	Channel	DATE:	8-20-69	7 1/2' QUADRANGLE:	Renovo West
REPORTED COAL NAMES:	Lower Kittanning	JOINTING:	N29W, vert.; N52E, vert.	WEATHERING:	Fairly fresh

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
6.0+	Sandstone			Lt gy																						Slabby, blocky; medium to coarse grained; micaceous; common plant fragments; coaly band at base.
2.0	Siltstone		S	Md lt gy																						Slabby, blocky, rubbly; micaceous.
7.5	Clay shale		S	Mod ol gy																						Chippy, hackly; orange weathering band at top with limonite concretions.
4.5	Sand-silt laminite grading up to silt shale		G	Lt ol gy																						Chippy, slabby; micaceous.
21.0	Claystone grading up through silt shale and siltstone to sand-silt laminite		S	Md dk gy grading up to lt gy																						Blocky and hackly grading up to flaggy, chippy, and slabby; sandstone at top with carbonaceous laminae; micaceous; plants; some thin siderite laminae and lenses.

SITE/STATION NO. 103-13 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)										
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
			S																								
5.25	Coal	0.60		Bk	B		X				X	X	M-D	0.4	19.3	55.0	25.3	3.9	64.8	1.1	3.6	1.3	11320	8	Above 2910	Blocky to cubic fracture.	Coal rolls slightly and thickens where seam swells down.
			S																								
	Clay shale	0.30		Gys bk																						Parting, hackly.	
			S																								
	Coal	0.60		Bk	B		X					X	M-MD	0.5	20.9	69.6	9.0	4.5	79.9	1.3	2.4	2.9	13890	9	2630	Cubic to splintery fracture.	
			S																								
	Bone coal	0.10		Bk																						Parting.	
			S																								
	Coal	2.15		Bk	B	X					X	X	M-MB	0.6	21.0	71.4	7.0	4.6	81.9	1.4	2.2	2.9	14290	9	2260	Splintery to semi-rough fracture; many knife-edge pyrite partings; some ½" lenses of pyrite.	
			S																								
	Clay shale	0.10		Gys bk																						Parting; hackly.	
			S																								
	Coal	1.40		Bk	B		X					X	M-MD	0.6	19.9	66.0	13.5	4.3	75.5	1.2	2.6	2.9	13160	8½	2780	Splintery to rough fracture; some knife-edge pyrite partings.	
			S																								
0.5+	Clay shale			Gys bk																						Papery, chippy; few fossil leaves (Calamites).	

SITE/STATION NO. 114-3 (page 1)	COUNTY: Clinton		COAL SAMPLE NO(S).: 411027/773110A
COMPANY: Fink and Stackhouse	LAT. °N: 41°10'25"	ELEV. (base lower coal):	411027/773110B
MINE:	LONG. °W: 77°31'11"	TWP.: Colebrook	
PERMIT:	GEOLOGIST: WAB	15' QUADRANGLE: Howard	JOINTING: Coal: N26W, N66E
SAMPLING METHOD: Channel	DATE: 8-9-71	7 1/2' QUADRANGLE: Farransdale	
REPORTED COAL NAMES: Lower Mercer			WEATHERING: Fresh

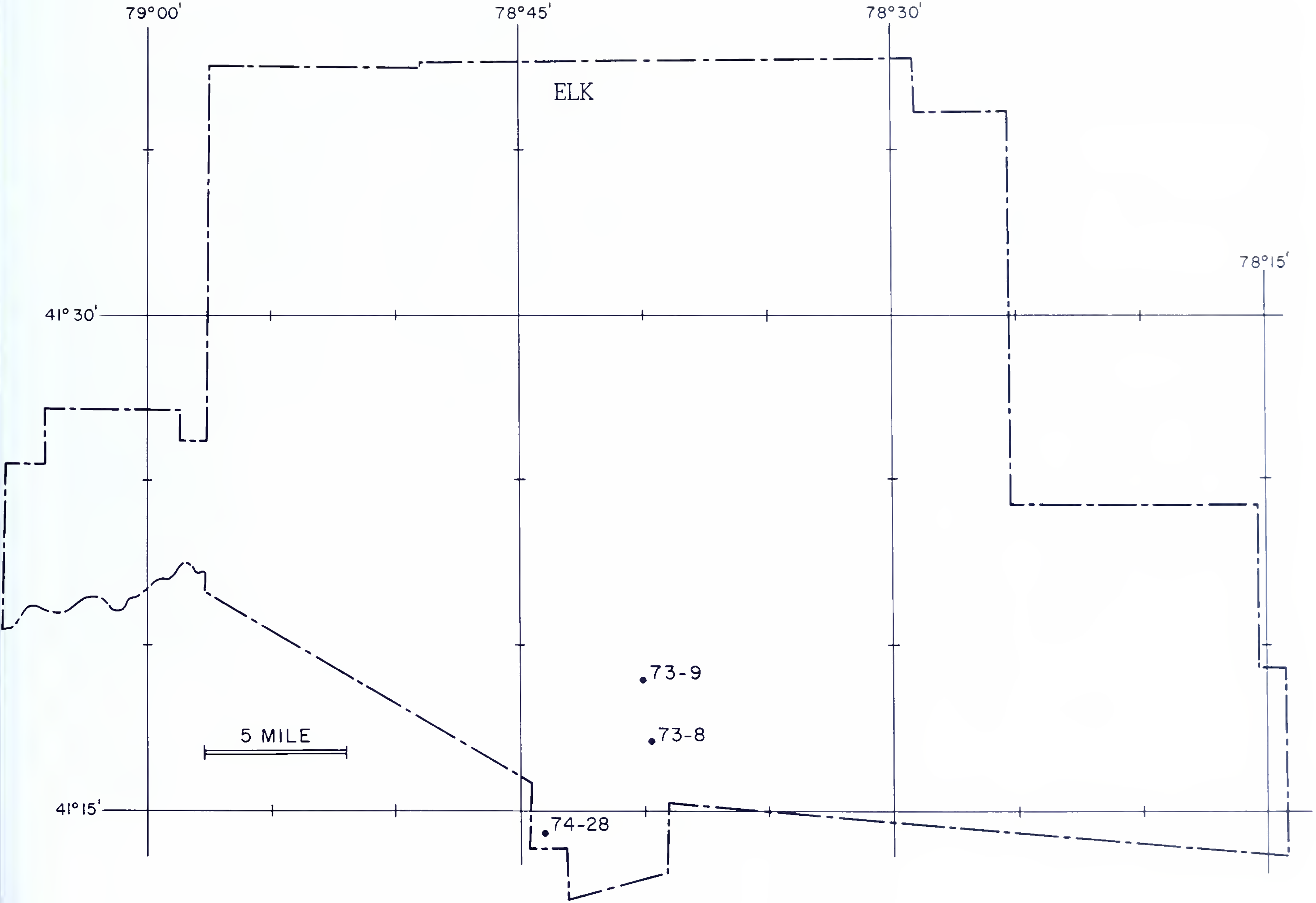
STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)													
						ABUNDANCE				THICKNESS																
						>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm		MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
4.2+	Silty clay shale		G	Md dk gy to md gy																						Few plant fragments. Siltier upward. Subplanar bedding.
0.4	Carbonaceous clay shale		S	Vy dk gy to bk																						Few plant fossils. Jointed as coal.
0.7	Coal		S	Vy dk gy to bk	B				X		X	X	MD M MB	4.6	19.5	47.5	28.4	3.6	56.1	0.8	10.7	0.4	9410	NC	2810	
0.6	Carbonaceous claystone		S	Vy dk gy																						Highly fractured. Rooted. Chippy.
2.8	Claystone		G	Vy dk gy to md dk gy, bn gy																						Semi-hard clay. Rooted. Weathers to chips (smaller than underlying unit).
3.5	Claystone		S	Dk gy to md gy																						Semi-hard clay. Weathers to chips. Rooted, internally slumped.
2.7	Coal		S	Bk	B				X			X	M MD D	1.8	18.8	51.8	27.6	3.5	59.6	0.8	8.0	0.5	10120	1	Above 2910	Claystone lens 0.1' thick 0.6' above base. Claystone band 0.4' thick 1.4' from top. Clay rich in places.
0.1	Claystone			Md dk gy to md lt gy																						Few roots. Thickness varies up to 0.3'. Hard clay.

SITE/STATION NO. 114-3 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.1	Coal		S	Vy dk gy to bk	NB				X			X	D													Not sampled. Clay rich.
2.4	Claystone		S	Vy dk gy to md dk gy, dk ol gy																						Hard clay being mined. Flint to block clay. Few nodules; rooted.
0.6+	Claystone		G	Md gy to lt gy																						Mine floor. Hard clay -- nodule flint to nodule block clay. Rooted.

SITE/STATION NO. 114-4	COUNTY: Clinton		COAL SAMPLE NO(S).: 410849/774003/A, B, C
COMPANY: Rougeux & Trimpey Coal Co.	LAT. °N: 41°08'49"	ELEV. (base lower coal): Appx. 1335'	
MINE: Scootac West	LONG. °W: 77°40'03"	TWP.: Beech Creek	
PERMIT: 86-5	GEOLOGIST: TMB	15' QUADRANGLE: Howard	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-26-69	7 1/2' QUADRANGLE: Howard NW	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fairly fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									Coal blossom 25' over mined unit.
8.0	Interbedded silt shale and sandstone			Md lt gy																						Platy, flaggy, slabby; fine-grained sandstone; micaceous; ripples.
8.5	Clay shale and claystone		G	Md dk gy																						Chippy, hackly; common siderite nodules up to 3"; silty upward.
1.0	Clay shale and claystone		G	Dk gy																						Chippy, blocky; few megaspores.
2.3	Coal	0.5	S	Bk	B		X				X	X	D	0.5	19.7	53.1	26.7	3.8	62.1	1.0	2.7	3.7	10990	9	2700	Discarded in mining.
	Clay shale	0.4																								
	Coal	0.9		Bk	B	X						X	MB-MD	0.7	20.9	64.1	14.3	4.3	73.6	1.2	1.6	5.0	13040	9	2070	Splintery fracture; ½" pyrite parting at base; 1" bone coal at top.
	Coal	0.5		Bk	B	X					X	X	M-MD	0.4	22.1	67.4	10.1	4.5	78.1	1.2	1.8	4.3	13810	9	2080	Rough to cubic fracture; few fusain partings.
0.5+	Underclay		S	Ol gy																						Hackly, rubbly.


79°00'
78°45'
78°30'
78°15'
41°30'
41°15'
ELK
73-9
73-8
74-28
5 MILE

SITE/STATION NO. 73-8	COUNTY: Elk		COAL SAMPLE NO(S).: 411700/783952
COMPANY: Tamburlin Bros. Coal Co.	LAT. °N: 41°17'00"	ELEV. (base lower coal): Appx. 1910'	
MINE: Reed Strip	LONG. °W: 78°39'52"	TWP.: Fox	
PERMIT: 472-1	GEOLOGIST: TMB	15' QUADRANGLE: Ridgway	JOINTING: N40W, vert.; N70W, vert.; N10E, vert.
SAMPLING METHOD: Channel	DATE: 8-19-69	7 1/2' QUADRANGLE: Brandy Camp	
REPORTED COAL NAMES: Middle Kittanning Coal			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
10.0+	Clay shale grading up to silt shale and siltstone			Gys bk to lt ol gy																						Chippy, slabby, rubbly.
0.5	Coal		S	Bk	B																					Weathered.
1.0	Underclay		S	Lt ol gy																						Hackly.
8.0	Sand-silt laminite		G	Md lt gy																						Flaggy, slabby; micaceous; plant fragments and leaves; silt sized to fine grained.
14.0	Interbedded clay shale and silt shale with some sandy beds		G	Md gy																						Platy, flaggy; very flat bedded.
1.65	Coal		S	Bk	B		X				X	X	D-MD	1.2	31.6	59.4	7.8	5.1	77.6	1.4	6.0	2.1	13790	9	2180	Rough to cubic fracture; occasionally bony at top.
0.2+	Underclay		S	Md dk gy																						Brittle; rubbly.

SITE/STATION NO.	73-9 (page 1)	COUNTY: Elk		COAL SAMPLE NO(S).:	411849/784008
COMPANY:	Starr Coal Co.	LAT. °N: 41°18'49"	ELEV. (base lower coal): Appx. 1750'		
MINE:	Starr Strip No. 1	LONG. °W: 78°40'08"	TWP.: Fox		
PERMIT:	368-3	GEOLOGIST: TMB	15' QUADRANGLE: Ridgway	JOINTING:	N65W, vert.; N35E, vert.
SAMPLING METHOD:	Channel	DATE: 8-19-69	7 1/2' QUADRANGLE: Brandy Camp		
REPORTED COAL NAMES:	Middle Kittanning			WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
25.0±	Clay shale grading up to sand-silt laminite			Lt ol gy																						Partly covered.
2.0±	Coal		S	Bk																						Weathered.
20.5	Partly covered interval: sand-silt laminite at base, underclay with freshwater limestone at top.		S																							Spheroidal weathering in limestone.
0.2	Coal		S	Bk	M																					Weathered.
4.0	Underclay		G	Lt ol gy																						Chippy, hackly; rootlets.
8.0	Silt shale grading up to clay shale		G	Lt ol gy																						Chippy; rare calcareous zones.
15.0	Clay shale grading up to silt shale		S	Md gy																						Chippy; common fine mica; rare calcareous zones.
0.7	Coal		S	Bk			X	X			X	X	MD -D													Cubic fracture; weathered.
2.0	Underclay		G	Md gy																						Silty at base.
10.0	Interbedded sandstone and sand-silt laminite		S	Mod yls gy																						Flaggy, chippy, slabby; abundant plant fragments; silt sized to fine grained.
15.0	Sandstone			Lt gy																						Slabby, blocky; strong crossbedding; medium to fine grained; micaceous; coaly laminae in middle.

SITE/STATION NO. 73-9 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.5	Sand-silt laminite		G	Md lt gy																						Chippy, slabby; micaceous; large ripples.
1.0	Clay shale grading up to silt shale		G	Md dk gy																						Chippy; rare leaves.
2.1	Coal	0.70	S	Bk	B		X				X	X	M-D	1.3	32.7	61.0	5.0	5.3	79.9	1.5	6.5	1.8	14230	9	2140	Top Middle Kittanning coal; blocky to splintery fracture; few knife-edge pyrite partings.
	Coal	0.55		Bk	B		X				X	X	M-MD	1.3	32.8	61.4	4.5	5.3	80.5	1.5	6.4	1.8	14280	9	2210	Blocky to splintery fracture; few knife-edge pyrite partings.
	Coal	0.85		Bk	B	X					X	X	M-MD	1.1	32.5	60.8	5.6	5.2	79.1	1.5	6.7	1.9	14110	9	2730	Blocky fracture; abundant fusain in top 1".
1.5+	Underclay		S	Md dk gy																						Hackly, rubbly.

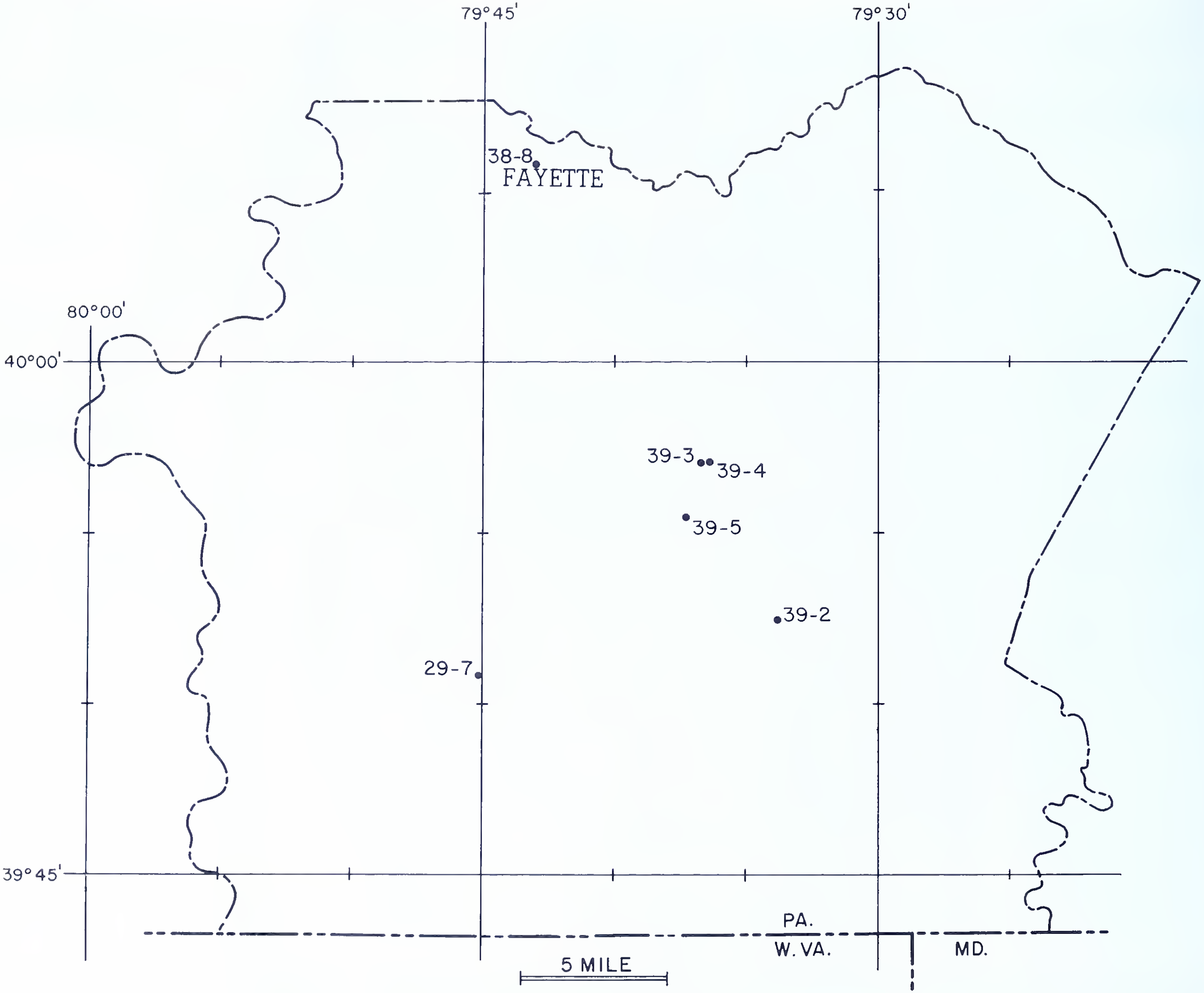
SITE/STATION NO. 74-28
COMPANY: Doan Coal Co.
MINE:
PERMIT: 154-9
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

COUNTY: Elk
LAT. °N: 41°14'18"
LONG. °W: 78°44'08"
GEOLOGIST: WAB,ADG
DATE: 9-4-70

ELEV. (base lower coal): Appx. 1800'
TWP.: Horton
15' QUADRANGLE: Penfield
7 1/2' QUADRANGLE: Sabula

COAL SAMPLE NO(S).: 411418/784408
JOINTING: Sandstone: N7W, N23W, N69E, N23E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18.0+	Clay shale			01 gy																						Appears to become sandy near top.
			S																							
7.0	Silt shale	4.0		Bk																						
			G																							
	Sandstone	3.0		Dk to md dk gy																						Crossbedded. Some sand-silt laminae near top.
			S																							
0.4	Clay shale			Bk																						Fissile.
			S																							
3.25	Coal			Bk	B	X				X			B-MB	1.2	35.7	58.1	5.0	5.3	79.4	1.6	7.2	1.5	14190	9	2140	
			S																							
0.5+	Claystone			Tan, md gy																						Underclay. Includes limestone nodules.


79° 45'
79° 30'
80° 00'
40° 00'
39° 45'
38-8
FAYETTE
39-3
39-4
39-5
39-2
29-7
PA.
W. VA.
MD.
5 MILE

SITE/STATION NO. 29-7	COUNTY: Fayette		COAL SAMPLE NO(S).: 395058/794505/2A, -/2B, -/2C, -/2D
COMPANY: Soberdash Coal & Coke	LAT. °N: 39°50'58"	ELEV. (base lower coal): Appx. 1070'	
MINE: Tent strip	LONG. °W: 79°45'05"	TWP.: Georges	
PERMIT: 111-26	GEOLOGIST: WEE	15' QUADRANGLE: Masontown	JOINTING: N80W, N10E
SAMPLING METHOD: Channel	DATE: 7-17-69	7 1/2' QUADRANGLE: Smithfield	
REPORTED COAL NAMES: Sewickley			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
42	Sandstone		G	Lt gy																						0.2' - 0.8' beds. Crossbedded. Silt to fine grained.
8-10	Siltstone		S	Md gy																						Plant fossils.
0.5	Silt shale		S	Dk gy																						Plant fossils. Carbonaceous.
5.1	Coal	0.85	S	Bk	B	X					X	X	M to MD	0.9	33.7	55.1	10.3	5.1	74.1	1.6	5.1	3.8	13190	9	2080	Splintery.
	Coal	1.45	G	Bk	B	X					X	X	M to MD	1.0	35.5	56.1	7.4	5.3	77.9	1.8	5.0	2.6	13790	9	2530	Splintery.
	Coal	0.60	G	Bk	B	X					X	X	MD to D	1.1	29.1	53.9	15.9	4.7	70.9	1.4	5.5	1.6	12420	8	Above 2910	Blocky to rough fracture.
	Coal	2.20	S	Bk	B	X				X	X	X	M to MD	0.9	33.8	54.6	10.7	5.0	74.6	1.6	4.6	3.5	13280	9	2170	Blocky.
0.1+	Claystone			Md dk gy																						Mine floor.

SITE/STATION NO. 38-8 (page 1)	COUNTY: Fayette	COAL SAMPLE NO(S).: 400533/794306/2 and 400540/794257/9
COMPANY:	LAT. °N: 40°05'33" ELEV. (base lower coal): 895'	
MINE: Road cut	LONG. °W 79°43'06" TWP.: Perry	
PERMIT:	GEOLOGIST: WEE 15' QUADRANGLE: Connellsville	JOINTING: N73E (dip 65SW), N40E (vert.), N20E (dip 65SW), N40W (vert.). Also curved joint faces.
SAMPLING METHOD: Channel	DATE: 6-25-73 7 1/2' QUADRANGLE: Dawson	
REPORTED COAL NAMES: Unknown		WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10+	Silty clay shale																									Weathered. Plant fragments.
58	Sandstone		S	Md lt gy to lt gy																						Beds ½" to 6'. Silt to medium grained. Planar crossbedding. Mica. Dark minerals, subgraywacke.
1.6	Coal		S	Bk	B				X		X	X	MB to B	3.1	31.9	55.2	9.8	5.2	74.1	1.4	8.5	1.0	13090	9	2280	Very hard. Sample No. 400540/794257/9.
12	Silty clay shale		S	Ol gy																						Plant fragments.
3	Interbedded silty clay shale and clayey siltstone		G	Gn gy to md gy																						Plant fragments.
8	Silty clay shale		G	Gn gy to md gy																						Plant fragments; hackly.
2.5	Silty sandstone		G	Ol gy																						Silt to fine grained. Plant fragments. Mica. Dark minerals. Subgraywacke. Planar bedded.
0-0.3	Carbonaceous clay shale		U	Bk																						Plant fragments. Papery vitrain lenses.
4.5	Clay shale		G	Dk gy																						Invertebrate fossils (*Lingula* sp. and/or *Anthraconauta* sp.). Plant fragments.
2.5	Silty sandstone		S	Lt gy																						Silt to fine grained. Hard. Mica, dark minerals. Subgraywacke.

SITE/STATION NO. 38-8 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Bonded (B), Non-Banded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm														
4	Silt shale		G	Md dk gy																						Siderite nodules.
0.5	Clay shale		G	Dk gy																						Plant fragments. Carbonaceous streaks.
2.0	Claystone		G	Md lt gy																						Siderite nodules. Plant fragments.
1.5	Silty claystone		G	Md lt gy																						Siderite nodules. Plant fragments.
3	Claystone		G	Ol gy																						Plant fragments.
3	Silty claystone		G	Ol gy																						Plant fragments.
45	Sandstone		G	Lt bn gy																						Silt to fine grained. Trough crossbedding. Mica, chlorite, dark minerals. Top 20' locally replaced by medium-light-gray sandy silt shale.
2.9	Coal		U	Bk	B			X	X			X	M to MB	16.8	26.4	48.7	8.1	4.9	57.3	1.1	28.0	0.6	9370	Non-caking	2140	Sample 400533/794306/2.
0.2+	Claystone (underclay)		S	Md lt gy																						

SITE/STATION NO. 39-2	COUNTY: Fayette			COAL SAMPLE NO(S).:	395228/793344/2, 395228/793344/4B
COMPANY: Purco Coal Co.	LAT. °N: 39°52'28"	ELEV. (base lower coal): Appx. 2220'			
MINE:	LONG. °W: 79°33'44"	TWP.: Stewart			
PERMIT: 413-4	GEOLOGIST: WEE	15' QUADRANGLE: Uniontown		JOINTING:	
SAMPLING METHOD: Channel	DATE: 8-11-71	7 1/2' QUADRANGLE: Ft. Necessity			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12+	Sandstone		U	Lt gy to vy lt gy																						Medium grained. Basal shale-chip conglomerate. Plant fossils.
16.5	Siltstone to silt shale		S	Md lt gy																						Siderite nodules to 0.1'. Wavy bedding. Locally sandy.
1.7	Coal		S	Bk	B			X				X	MD	3.0	24.8	51.0	21.2	4.4	64.4	1.0	6.3	2.7	11340	7½	2720	High fusain content.
2.3	Coaly clay shale		S	Bk																						Several coal lenses to 0.05'.
2.2	Silty claystone		S	Lt bn gy																						Plant fossils. Some silt lenses.
2.25	Coal		S	Bk	B		X	X			X	X	MB	5.1	26.5	57.5	10.9	5.0	72.9	1.3	8.3	1.6	12820	9	2760	
1+	Underclay			Md lt gy																						Very plastic.

SITE/STATION NO. 39-3 (page 1)	COUNTY: Fayette		COAL SAMPLE NO(S).: 395702/793648/4
COMPANY: Walter Green, Inc.	LAT. °N: 39°57'02"	ELEV. (base lower coal): Appx. 1380'	
MINE: Liberty No. 1 strip	LONG. °W: 79°36'48"	TWP.: Dunbar	
PERMIT: 250-6	GEOLOGIST: WEE	15' QUADRANGLE: Uniontown	JOINTING: N80W, N10E
SAMPLING METHOD: Channel	DATE: 7-18-69	7 1/2' QUADRANGLE: So. Connellsville	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
-	Coal		S	Bk																						Poor exposure.
1.0	Underclay		G	Dk gy																						
1.5	Sandy claystone		G	Md gy																						
3.0	Sandstone		S	Vy lt gy																						Medium to coarse grained. Hard. 1.0' beds.
0.5-1.0	Carbonaceous claystone		S	Gy bk																						Plant fossils.
5.5	Silty claystone		G	Md dk gy to md gy																						Siderite nodules to 0.3' x 1.0'.
0.1-0.3	Bone coal		G	Bk to gy bk	M				X			X	D													
3.5	Silty claystone		G	Dk gy																						Siderite nodules to 0.3' x 1.0'.
4.5	Sand-silt laminite		G	Md dk gy and lt gy																						
5.5	Clayey siltstone to silt shale		G	Dk gy to md dk gy																						
5.5	Silty claystone		G	Dk gy to md dk gy																						Siderite nodules to 0.2'.
1.0	Clay shale			Dk gy																						Plant fossils.

SITE/STATION NO. 39-3 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

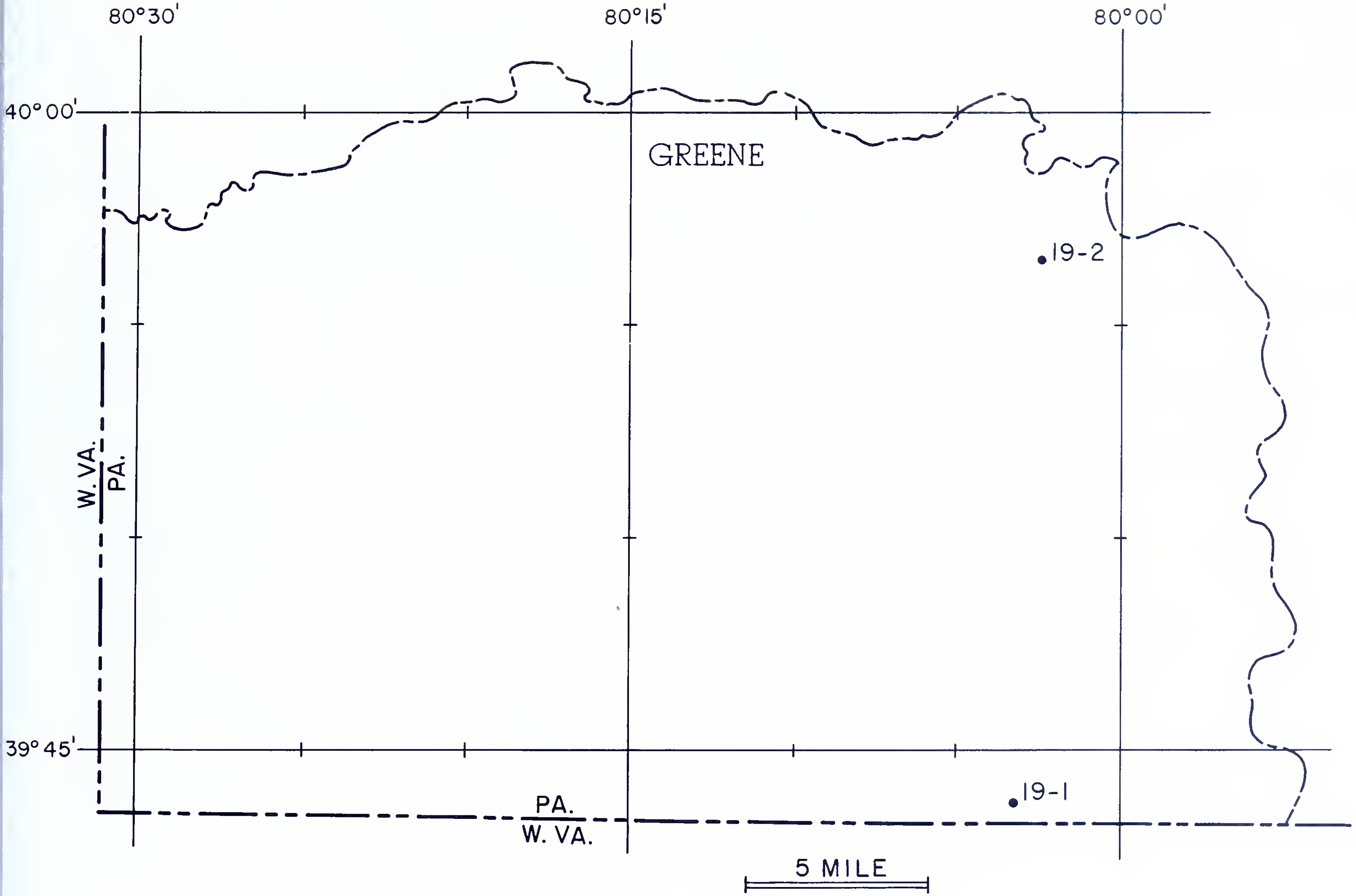
STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.2	Coal		S	Bk	B		X					X	B-MB	0.9	29.2	59.9	10.0	5.0	76.8	1.4	3.9	2.9	13580	9	2080	Reported to range from 3.2' to 3.8'. Fine pyrite and sulfate blossom.
0.6	Underclay		S	Md gy to md lt gy																						Plant fossils.
0.2-0.3	Coal		S	Bk	B			X				X	M-MB													
0.4-0.6	Claystone		G	Dk gy																						Plant fossils.
3+	Underclay		G	Md gy to md lt gy																						Plant fossils. Mined commercially.

SITE/STATION NO. 39-4	COUNTY: Fayette		COAL SAMPLE NO(S).: 395705/793634/1
COMPANY: Walter Green, Inc.	LAT. °N: 39°57'05"	ELEV. (base lower coal): Appx. 1510'	
MINE: Liberty No. 1 strip	LONG. °W: 79°36'34"	TWP.: Dunbar	
PERMIT: 250-6	GEOLOGIST: WEE	15' QUADRANGLE: Uniontown	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-18-69	7 1/2' QUADRANGLE: So. Connellsville	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Weathered

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15+	Siltstone to silt shale		G	Gy bk to dk gy																						
1.2	Bony coal to coaly shale		G	Bk																						
7.0	Silty claystone to clay shale		G	Md dk gy																						Siderite nodules to 0.1' Plant fossils.
15.5	Siltstone		G	Md gy																						Plant fossils.
0.4	Clay shale		S	Md dk gy																						
2.70	Coal			Bk	B			X			X	X	B	0.9	29.4	61.3	8.4	5.0	77.4	1.5	3.5	4.2	13750	9	2080	Blocky to splintery.

SITE/STATION NO. 39-5	COUNTY: Fayette		COAL SAMPLE NO(S).: None
COMPANY: Unknown	LAT. °N: 39°55'19"	ELEV. (base lower coal): 2100'	
MINE: Clay Mine	LONG. °W: 79°37'15"	TWP.: Dunbar	
PERMIT: Unknown	GEOLOGIST: WEE	15' QUADRANGLE: Uniontown	JOINTING:
SAMPLING METHOD: None	DATE: 6-21-73	7 1/2' QUADRANGLE: So. Connellsville	
REPORTED COAL NAMES: Unknown			WEATHERING: Very weathered

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S= Sharp, G= Gradational, U= Uncon.)	COLOR	COAL: Bonded(B), Non-Bonded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	ULTIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
14+	Sandstone		U	Lt gy to lt bn gy																						Fine to very fine grained. Cut-and-fill. Minor trough crossbedding. Current ripples.
1.0-3.0	Clay shale		S	Md gy																						
0.5	Coal		S	Bk																						
0.3	Clay shale		S	Md gy																						
0.2	Coal		S	Bk																						Weathered.
1.4	Claystone (underclay)		G	Md lt gy																						
0.5	Silty claystone (underclay)		G	Md gy																						Plant fragments.
2.0	Claystone (underclay)		G	Md lt gy to lt gy																						Soft. Plastic when wet.
0.4	Clay shale		S	Dk gy																						
20	Claystone (underclay)		S	Md gy																						
0.1-0.4	Claystone (semi-hard clay)		S	Md dk gy																						
0.3+	Claystone (underclay)			Md gy																						Not mined.

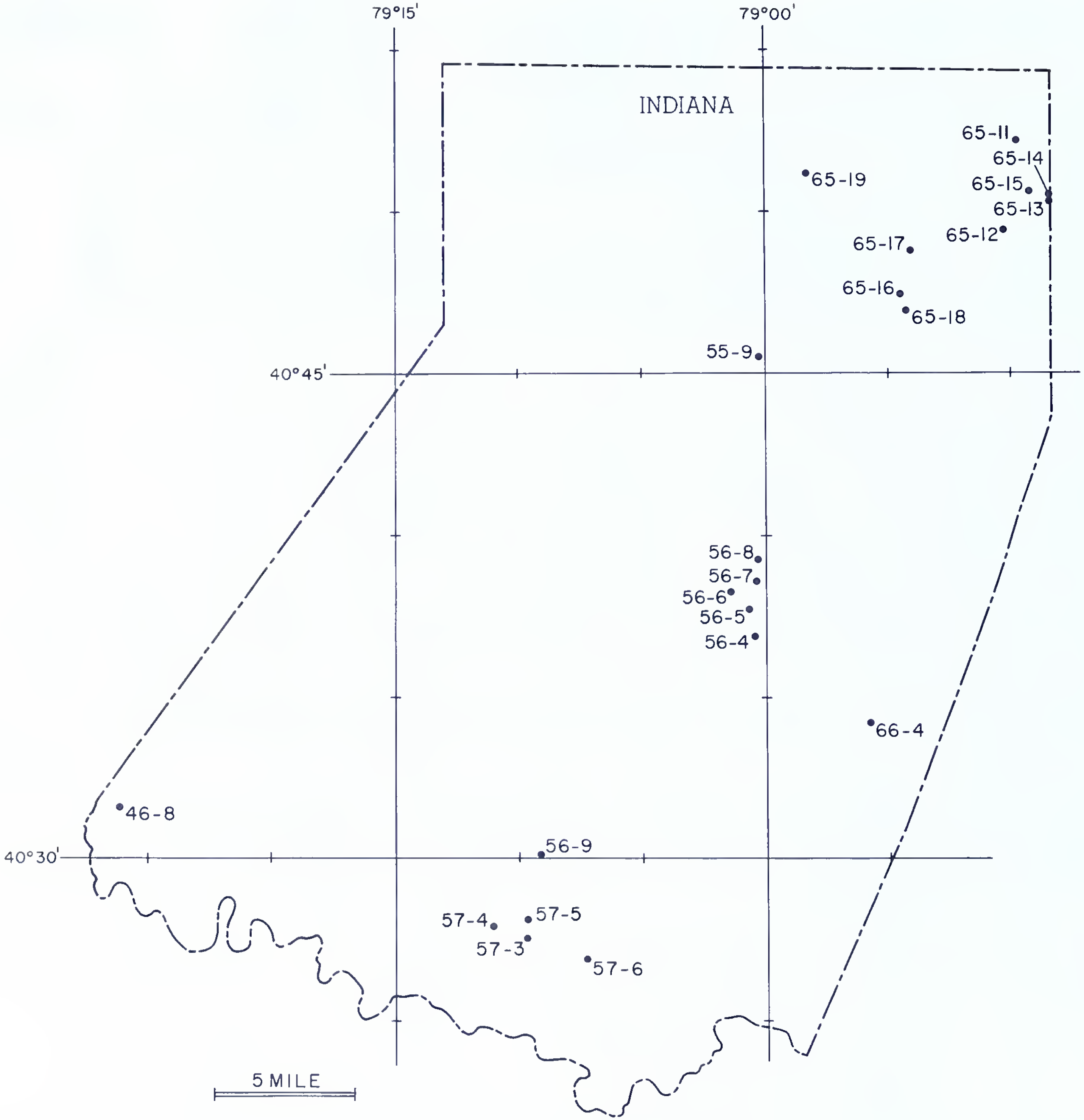

80°30'
80°15'
80°00'
40°00'
39°45'
GREENE
19-2
19-1
W. VA.
PA.
PA.
W. VA.
5 MILE

SITE/STATION NO. 19-1	COUNTY: Greene		COAL SAMPLE NO(S).: 394348/800314/2A, -/2B, -/2C, -/2D, -/2E, and -/2F
COMPANY: Dipple & Dipple	LAT. °N: 39°43'48"	ELEV. (base lower coal): Appx. 980'	
MINE: Cline	LONG. °W: 80°03'14"	TWP.: Dunkard	
PERMIT: 486-1	GEOLOGIST: WEE	15' QUADRANGLE: Blacksville	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-15-69	7 1/2' QUADRANGLE: Osage	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS: PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN ABUNDANCE				VITRAIN THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18+	Sandstone			Md lt gy to lt gy																						Fine to medium grained. Cuts out upper part of clay shale below. Lateral accretion beds.
8 to 15	Clay shale		U	Md gy																						Siderite nodules. Plant fossils.
7.5 to 6.9	Bony coal	0.60	S	Bk	B			X			X	X	M-MB	1.4	27.7	42.9	28.0	4.1	57.1	1.3	7.5	2.0	10090	5½	Above 2910	Not mined.
	Underclay	0.15 to 0.20	S	Md gy																						
	Coal	2.25 to 1.20	S	Bk	B		X			X	X	X	B-MB	1.3	32.9	49.7	16.1	4.8	68.7	1.5	7.1	1.8	12140	8	2790	Zone of pyrite nodules 0.9' above base.
	Underclay	0.90 to 0.50	S	Md gy to md dk gy																						Plant fossils.
	Coal	0.95 to 1.10	S	Bk	B		X				X	X	B-MB	1.2	36.1	50.7	12.0	5.1	71.9	1.6	7.4	2.0	12900	8	2720	
	Bony coal	0.15 to 0.00	G	Bk			X				X	X	MD	1.3	30.0	40.5	28.2	4.3	57.1	1.3	7.9	1.2	10170	3½	Above 2910	Disappears from east to west.
	Coal	1.25 to 2.25	G	Bk			X			X	X	X	B-MB	1.4	31.0	49.0	18.6	4.7	65.9	1.5	8.4	0.9	11640	7½	Above 2910	
	Clay shale	0.15	S	Gy gk to bk																						Plant fossils. Thin coaly lenses.
	Coal	0.90 to 0.95	S	Bk			X				X	X	B	1.3	33.7	53.3	11.7	5.0	72.9	1.6	7.9	0.9	12910	8	Above 2910	
0.5+	Underclay and siderite		S	Md gy																						25% siderite nodules.

SITE/STATION NO. 19-2	COUNTY: Greene		COAL SAMPLE NO(S).: 395634/800225/1A, 395634/800225/3A
COMPANY: Jane Coal Co.	LAT. °N: 39°56'34"	ELEV. (base lower coal): Appx. 980'	
MINE:	LONG. °W: 80°02'25"	TWP.: Jefferson	
PERMIT: 551-1	GEOLOGIST: WEE	15' QUADRANGLE: Waynesburg	JOINTING: Coal: N77W, N23E
SAMPLING METHOD: Channel	DATE: 8-10-71	7 1/2' QUADRANGLE: Mather	
REPORTED COAL NAMES: Waynesburg			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
17+	Sandstone		S	Lt yl gy																						Fine to coarse grained. Trough and festoon crossbedding. Feldspathic.
4.0-6.0	Sandstone		U	Gy or. pk																						Medium to coarse grained. Massive beds. Feldspathic.
6.0-7.0	Silty clay shale		S	Lt ol gy																						Plant fossils in lower 1.0'.
0.4	Coaly shale		G	Bk																						
0.55	Coal		S	Bk	B				X			X	B													Not mined.
0.2-0.3	Silt shale		S	Dk gy to bk																						Plant fossils. Pyrite flakes.
1.7	Coal		S	Bk	B		X				X	X	B	1.6	34.8	47.4	16.2	4.8	68.0	1.5	6.2	3.3	12230	8	2190	Several thin partings.
1.5	Claystone		S	Md dk gy																						Plant fossils. Small patches of light-brown-gray pyrite.
1.7	Coal		S	Bk	B		X				X	X	B	3.5	33.6	52.2	10.7	5.2	68.3	1.5	11.6	2.7	12780	8½	2190	
0.3±	Claystone		S																							Reported, but not seen.
0.4±	Coal																									Reported, but not seen. Not mined.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5 MILE

SITE/STATION NO. 46-8 (page 1)	COUNTY: Indiana			COAL SAMPLE NO(S).: 403133/792628/2A through 2H	
COMPANY: Thomas A. Feld Coal Co.	LAT. °N: 40°31'33"	ELEV. (base lower coal): Appx. 1090'			
MINE:	LONG. °W: 79°26'28"	TWP.: Conemaugh			
PERMIT: 572-1	GEOLOGIST: ADG	15' QUADRANGLE: Elders Ridge		JOINTING: Coal: N61W, N66W, N69W, N33E	
SAMPLING METHOD: Channel	DATE: 9-9-71	7 1/2' QUADRANGLE: Avonmore			
REPORTED COAL NAMES: Pittsburgh coal				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Soil cover																									
13.0	Sandstone			Lt ol gy																						Fine to medium grained.
16.0	Sand-silt laminite shale		S	Md to lt gy																						Fine to very fine grained. Plant fragments common.
1.8	Clay shale		S	Md dk gy																						Few plant fragments.
12.2	Coal	0.2	S	Bk	B				X			X	M-MB	1.5	27.4	38.8	32.3	3.9	52.8	1.2	4.1	5.7	9640	5½	2120	Very shaly.
	Black shale	0.9	S	Bk																						Profuse thin coaly lenses and plant stems.
	Coal	0.75	S	Bk	B				X		X	X	M-MB	1.8	29.3	46.5	22.4	4.4	63.6	1.3	7.0	1.3	11250	7½	-	Thin clay shale lenses common.
	Silt shale	0.15	S	Bk																						Profuse plant stems.
	Coal	1.25	S	Bk	B	X				X	X		M-MD	1.6	31.6	53.5	13.3	4.9	71.9	1.5	6.9	1.5	12830	8	-	
	Claystone	1.05	S	Bk to gys bk																						Slickensides common. Few very thin coaly lenses.
	Coal	0.95	S	Bk	B				X			X	M-MD	1.8	28.2	38.5	31.5	4.1	53.9	1.4	5.9	3.2	9680	3½	2790	Tough, bony. Pyritized plant stems.
	Claystone	0.15	S	Bk to gys bk																						Slickensides common. Few very thin coaly lenses.
	Coal	2.05	S	Bk	B				X			X	M-MB	2.4	34.1	54.3	9.2	5.1	72.8	1.5	9.8	1.6	12940	7	2770	Top is tough, bony. Pyritized plant stems.

SITE/STATION NO. 46-8 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Black shale	0.5	S	Bk																						Profuse plant stems.
	Coal	1.35	S	Bk	B		X				X		M-MB	1.7	33.0	54.6	10.7	5.0	73.7	1.5	7.1	2.0	13070	9	2840	Thin bony lenses.
	Silt shale	0.3	S	Bk to gys bk																						Parting.
	Coal	0.2	S	Bk	B		X				X	X	M-MB	1.9	32.4	51.3	14.4	4.9	70.3	1.4	7.3	1.7	12470	8½	-	
	Silt shale	0.15	S	Bk to gys bk																						Few very thin coaly lenses.
	Coal	2.25	S	Bk	B		X				X	X	M-MB	2.0	34.0	54.5	9.5	5.1	74.6	1.4	6.8	2.6	13330	9	2390	
1.0+	Clay shale		S	Md to md dk gy																						Top is plastic clay. Mine floor.

SITE/STATION NO.	55-9	COUNTY:	Indiana			COAL SAMPLE NO(S).:	404533/790015
COMPANY:	Mears Coal Co.	LAT. °N:	40°45'28"	ELEV. (base lower coal):	Appx. 1570'		
MINE:		LONG. °W:	79°00'16"	TWP.:	East Mahoning		
PERMIT:	3-2 (A4)	GEOLOGIST:	WAB	15' QUADRANGLE:	Smicksburg	JOINTING:	Coal: N55W, N20E; silt shale: N70W
SAMPLING METHOD:	Channel	DATE:	8-17-71	7 1/2' QUADRANGLE:	Marion Center		
REPORTED COAL NAMES:	Lower Freeport					WEATHERING:	Fresh

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
																										Company opening new cut below active strip level of coal 60' below Lower Freeport; reported as Middle Kittanning.
15.0+	Silt shale			Lt ol gy																						Plant fossils. Slightly sandy in places. Planar bedding.
8.5	Sandstone		G	Md lt gy to vy lt gy, lt bl gy																						Very fine to coarse grained. Subplanar bedding. Thin coaly lenses and plant fossils.
8.4	Siltstone/silt shale		S	Md dk gy to md gy																						Plant fossils. Platy fracture. Subplanar bedding.
2.3	Coal		S	Bk	B			X			X	X	M MB	1.2	30.3	59.0	9.5	5.2	77.0	1.4	4.7	2.2	13670	9	2220	
-	Claystone		S	Md dk gy to md lt gy																						Mine floor. Underclay, rooted. Internally slumped.

SITE/STATION NO. 56-4	COUNTY: Indiana		COAL SAMPLE NO(S).: 403652/790028A, 403652/790028B
COMPANY: Morchesky Truck. & Exc. Co.	LAT. °N: 40°36'50"	ELEV. (base lower coal): Appx. 1480'	
MINE:	LONG. °W: 79°00'30"	TWP.: Cherryhill	
PERMIT: 641-71	GEOLOGIST: WAB	15' QUADRANGLE: Indiana	JOINTING: Coal: N73W; silt shale: N55E, N17W
SAMPLING METHOD: Channel	DATE: 8-12-71	7 1/2' QUADRANGLE: Brush Valley	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13.0+	Silt shale			Md dk gy to dk gy, gn gy																						Plant fossils. Planar bedding.
3.7	Coal	2.5	S	Bk	B			X			X		M MD	1.1	24.8	56.1	18.0	4.5	68.8	1.3	3.3	4.1	12320	8½	2140	Hard. Few pyrite nodules and lenses.
	Carbonaceous claystone	0.2	S	Vy dk gy to bk																						Pyrite lenses common.
	Coal	1.0	S	Bk	B			X		X	X		M MB	1.5	28.6	58.0	11.9	4.7	75.2	1.5	4.0	2.7	13330	9	2360	Thin pyrite and clay lenses present.
-	Siltstone		S	Md dk gy to dk gy																						Mine floor -- seat earth.

SITE/STATION NO.	56-5 (page 1)	COUNTY:	Indiana		COAL SAMPLE NO(S).: 403740/790042A, 403740/790042B
COMPANY:	Basic Minerals Corp.	LAT. °N:	40°37'40"	ELEV. (base lower coal): Appx. 1560'	
MINE:		LONG. °W:	79°00'47"	TWP.: Cherryhill	
PERMIT:		GEOLOGIST:	WAB	15' QUADRANGLE: Indiana	JOINTING: Clayey silt shale: N52W, N40E, N70W
SAMPLING METHOD:	Channel	DATE:	8-12-71	7 1/2' QUADRANGLE: Clymer	
REPORTED COAL NAMES:	Lower and Upper Freeport				WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Sandstone		S	Lt to vy lt gy																						Very fine to medium grained. Broken plant fossils. Planar bedded; platy fracture.
12.1	Clayey silt shale		S	Dk to md lt gy																						Plant fossils, coarser grained near top. Subplanar bedding.
0.3	Carbonaceous clay shale		S	Bk to vy dk gy																						Fractures same as coal. Few broken plant fossils.
1.2	Carbonaceous siltstone		S	Dk ol gy, dk bn, gy bk																						Dark band in highwall. Ancient soil horizon. Easily broken.
0.9	Clay shale		S	Dk to md dk gy																						Subplanar bedding. Sulfur stained.
2.4	Limestone		G	Md to md lt gy																						Percent insolubles varies from 15.5 to 70.8 in 3 samples taken. Few plant fossils present.
3.4	Claystone		S	Md to lt gy																						Underclay. Contains calcite nodules. Internally slumped.
0.1	Shaly coal		S	Bk to vy dk gy																						Nonpersistent.
7.0	Claystone			Md dk gy																						Underclay. Rooted. Internally slumped.

SITE/STATION NO. 56-5 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			G																							
2.1	Clay shale			Dk to md dk gy																						Plant fossils. Internally slumped.
			S																							
0.2	Shaly coal			Bk	B				X		X	X	D MD	1.0	14.7	21.8	62.5	2.1	27.2	0.6	3.0	4.6	4750	NC	2410	Sulfur stained.
			G																							
0.3	Carbonaceous clay shale			Bk to vy dk gy																						Few broken plant fossils.
			S																							
1.0	Claystone			Dk to md gy																						Few rootlets. Underclay.
			S																							
0.8	Sandy siltstone			Md gy																						Hard, resistant. Few rootlets.
			S																							
1.1	Silty claystone			Md dk to dk gy																						Semi-hard. Few rootlets.
			G																							
3.6	Silty clay shale			Dk to md dk gy																						Platy fracture. Thin irregular beds.
			S																							
0.2	Shaly coal			Bk	B				X			X	D	1.6	21.6	33.2	43.6	2.7	37.7	0.8	-	17.5	7190	1	2080	Blocky fracture. White sulfur staining common.
			S																							
0.1	Claystone			Dk gy, dk ol gy																						Subfissile.
			S																							
0.1	Shaly coal			Bk	NB				X			X	D													Blocky fracture.
			S																							
1.5	Claystone			Md dk to dk gy																						Noncalcareous. Weathers into small chips.

SITE/STATION NO. 56-5 (page 3)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE >60%	30-60%	15-30%	<15%	COAL: VITRAIN THICKNESS >5mm	2-5mm	1/2-2mm	COAL: Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.6	Siderite layer		G	Dk red gy to gy red																						Thickness varies from 0.6' (maximum) to .05'. Pyrite and calcite lenses common.
0.8	Calcareous siltstone		G	Md dk to dk gy																						Very calcareous. Irregular bedding.
9.6	Limestone		G	Md dk gy																						Nonfossiliferous. Internally homogeneous. In samples taken % insolubles varies from 4.03 to 34.9.

SITE/STATION NO. 56-6 (page 1)	COUNTY: Indiana		COAL SAMPLE NO(S).: 403814/790128A, 403814/790128B, 403814/790125A, 403814/790125B
COMPANY: Leasure Coal Co.	LAT. °N: 40°38'12"	ELEV. (base lower coal): Appx. 1230'	
MINE:	LONG. °W: 79°01'34"	TWP.: Cherryhill	
PERMIT: 563-2	GEOLOGIST: WAB	15' QUADRANGLE: Indiana	JOINTING: Coal: N57W, N30E;
SAMPLING METHOD: Channel	DATE: 8-17-71	7 1/2' QUADRANGLE: Clymer	silt shale: N30W, N7E
REPORTED COAL NAMES: Brookville - Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
																										Lower Kittanning coal being mined 20' above uppermost coal sampled.
6.0+	Sandstone		U	Lt gy to md lt gy																						Fine to very coarse grained. Plant fossils. Festoon crossbedded.
0.9	Carbonaceous clay shale		S	Bk to vy dk gy																						Thickness varies slightly (0.9' maximum thickness).
1.2	Coal		S	Bk to vy dk gy	B				X		X	X	MD D	33.4	23.2	31.2	12.2	5.7	39.2	0.7	41.8	0.4	6080	NC	2170	Clay rich and weathered where sampled.
9.4	Claystone		G	Md dk to lt gy																						Underclay -- rooted. Semi-hard.
11.8	Clay shale		S	Vy dk to md gy																						Few plant fossils. Platy fracture.
0.8	Coal		S	Bk	B				X		X		M MD D	24.7	24.0	43.0	8.3	5.3	51.6	0.9	33.5	0.4	8280	NC	2240	Few thin shale partings.
4.9	Claystone to silty claystone		S	Dk to lt gy, lt ol gy																						Underclay -- rooted.
0.5	Carbonaceous claystone			Dk to md dk gy																						Forms dark band in highwall.

SITE/STATION NO. 56-6 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S: Sharp, G: Gradational, U: Uncon)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm														
2.6	Silty claystone		G	Md to lt gy																						Silt content increases upward.
1.1	Silty clay shale		G	Md to md dk gy, gn gy																						Few plant fossils.
0.7	Sandstone		S	Md to lt gy																						Very fine to medium grained. Flaser bedding present. Unit thickens to 3.0' at NE end of cut. Few plant fossils.
≈4.0	Clay shale		S	Gn gy																						Lower 2.0' not exposed. Slightly silty in places.
≈1.0	Clay shale		?	Vy dk to dk gy																						Slightly carbonaceous.
2.4	Sandy siltstone		G	Md to lt md gy																						Seat earth, rooted. Sand increases upward.
9.4	Clayey silt shale		G	Gn gy																						Few plant fossils. Seepage at base of unit.
13.2	Silty clay shale		G	Md to dk gy, gn gy																						Invertebrate fossil (*Lingula* sp.) present. Chippy fracture. Subplanar bedding.

SITE/STATION NO. 56-6 (page 3)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.0	Shaly coal	1.0	S	Vy dk gy to bk	M				X		X		D MD	0.6	19.9	47.6	31.9	3.4	57.1	0.9	5.9	0.8	9900	2½	Above 2910	Approaches blocky carbonaceous claystone.
	Coal	3.0	G	Bk	B				X		X		MD	1.1	25.8	60.0	13.1	4.5	74.7	1.3	5.1	1.3	13120	7	Above 2910	Silty lenses common.
1.5+	Siltstone		S	Md to md dk gy																						Mine floor - seat earth. Hard. Rooted.

SITE/STATION NO. 56-7	COUNTY: Indiana		COAL SAMPLE NO(S).: 403832/790035A and 403832/790035B
COMPANY: Shick Coal Co.	LAT. °N: 40°38'30"	ELEV. (base lower coal): Appx. 1420'	
MINE:	LONG. °W: 79°00'40"	TWP.: Cherryhill	
PERMIT: 252-2	GEOLOGIST: WAB	15' QUADRANGLE: Indiana	JOINTING: Coal: N72W, N32E; silt shale: N32E
SAMPLING METHOD: Channel	DATE: 8-17-71	7 1/2' QUADRANGLE: Clymer	
REPORTED COAL NAMES: Lower Kittanning (No. 3)			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16.0	Sandstone			Md gy to vy lt gy																						Unit directly over coal in places. Very fine to very coarse grained sand. Contains plant fossils and coaly lenses.
4.0	Silt shale - sandy silt shale		G	Md gy to dk gy																						Plant fossils. Upper contact laterally gradational.
5.1	Coal	2.25	S	Bk	B			X			X		M MD D	5.4	26.3	49.4	18.9	4.6	63.2	1.1	10.9	1.3	11010	3½	2260	Carbonaceous clay shale lenses common. Vitrain content increases downward.
	Carbonaceous claystone lens	.05	S	Vy dk gy to bk																						Sulfur staining. Thickness varies slightly.
	Coal	2.8	S	Bk	B		X			X			B MB	4.9	29.8	58.0	7.3	5.2	75.7	1.3	7.7	2.8	13470	8½	2250	Soft, breaks easily. Weathered.
2.0+	Claystone		S	Vy lt gy to dk gy																						Mine floor. Underclay, rooted. Miner reports thickness about 15'.

SITE/STATION NO. 56-8
COMPANY: Shick Coal Co.
MINE:
PERMIT: 252-2
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning

COUNTY: Indiana
LAT. °N: 40°39'13"
LONG. °W: 79°00'25"
GEOLOGIST: WAB
DATE: 8-17-71

ELEV. (base lower coal): Appx. 1490'
TWP.: Cherryhill
15' QUADRANGLE: Indiana
7 1/2' QUADRANGLE: Clymer

COAL SAMPLE NO(S).: 403913/790025
JOINTING: Coal: N25E, N68W; silt shale: N83W, N3W, N32W
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Silty sandstone to sandy siltstone			Md dk gy to md lt gy																						Very fine to medium grained. Plant fossils present.
1.4	Silty claystone		U	Vy dk gy to md dk gy																						Few coaly lenses present. Fractures along joint planes.
23.8	Silt shale/siltstone		S	Md dk gy to md gy																						Subplanar bedding. Little vertical or horizontal lithologic variation. Many plant fossils.
1.9	Coal		S	Bk	B	X				X	X	X	M MB	1.2	25.4	61.5	11.9	4.6	75.9	1.2	5.4	1.0	13310	8½	Above 2910	Few thin nonpersistent carbonaceous clay shale lenses.
2.0+	Claystone		S	Md dk gy to md lt gy																						Mine floor. Underclay, rooted.

SITE/STATION NO. 56-9	COUNTY: Indiana	COAL SAMPLE NO(S).: 403004/790910A,
COMPANY: Hawk Brothers Coal Co.	LAT. °N: 40°30'01"	ELEV. (base lower coal): Appx. 1460'	403004/790910B, 403002/790910
MINE:	LONG. °W: 79°09'10"	TWP.: Center	
PERMIT: 121-6	GEOLOGIST: WAB	15' QUADRANGLE: Indiana	JOINTING: Coal: N65W to N55W to N45W from north
SAMPLING METHOD: Channel	DATE: 8-11-71	7 1/2' QUADRANGLE: Indiana	to south, N27E
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0+	Sandstone			Lt to md lt gy																						Medium to very coarse grained. Plant fossils. Festoon crossbedding -- irregular lower contact.
8.0	Silt shale		S	Dk to md lt gy, lt ol gy																						Unit thickness varies (8.0' maximum thickness). Cut out in places by overlying sandstone. Broken plant fossils.
5.9	Coal	1.5	S	Bk	B	X				X			B MB	1.3	28.3	61.0	9.4	4.8	77.3	1.4	3.0	4.1	13770	8	2080	
	Carbonaceous claystone	0.6	S	Bk																						Pyrite lenses common. Few coaly bands present.
	Coal	3.8	S	Bk	B		X			X	X		B MB	1.0	29.0	61.1	8.9	4.9	78.0	1.4	4.3	2.5	13880	9	2240	
														1.1	31.7	54.9	12.3	4.7	72.7	1.3	3.4	5.6	13130	8½	2090	Sample taken where part of bench is cut out by overlying sandstone.
	Claystone		S	Md dk to md lt gy																						Mine floor. Underclay.

SITE/STATION NO. 57-3	COUNTY: Indiana		COAL SAMPLE NO(S).: 402735/790952/2
COMPANY: North Cambria Fuel Co.	LAT. °N: 40°27'35"	ELEV. (base lower coal):	
MINE:	LONG. °W: 79°09'52"	TWP.: Burrell	
PERMIT: 10-25	GEOLOGIST: WEE-MAS	15' QUADRANGLE: New Florence	JOINTING: N55E, E-W; coal: N62W
SAMPLING METHOD: Channel face	DATE: 6-20-74	7 1/2' QUADRANGLE: Bolivar	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30+	Sandstone		S	Lt gy																						Tabular lensoidal beds.
4.5	Interbedded siltstone and clay shale		G	Md dk gy and ol bk																						Plant fossils common.
3.2	Clayey silt shale to clay-silt laminite		G	Dusky yl bn and ol gy																						
2.3	Clay shale		S	Dusky bn																						Color banded; siderite nodules.
3.4	Coal		S	Bk	B		X				X	X	MB	1.7	29.4	61.5	7.4	5.0	78.6	1.4	5.2	2.4	14000	8	2130	Pyrite lenses and nodules.
Top only exposed	Carbonaceous clay shale			Bn bk																						Coal lenses.

SITE/STATION NO.: 57-4 (page 1)
COMPANY: Morchesky Trucking & Excavation Co.
MINE:
PERMIT: 643-4
SAMPLING METHOD: Channel face
REPORTED COAL NAMES: Upper Freeport

COUNTY: Indiana
LAT. °N: 40°27'55"-28'01"
LONG. °W: 79°11'05"-06"
GEOLOGIST: WEE-MAS
DATE: 6-20-74

ELEV. (base lower coal):
TWP.: Burrell
15' QUADRANGLE: New Florence
7 1/2' QUADRANGLE: Bolivar

COAL SAMPLE NO(S).: 402758/791106/2A, 402758/791106/2B, 402758/791106/2C, 402758/791106/2D
JOINTING: Coal: N65W, N12E
WEATHERING: Fresh at base to very weathered at top

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30+	Shale (not examined)		G?																							
15±	Claystone (hard clay and semi-hard clay)		S	Gn gy to lt gy																						Some "oolitic" hard clay, somewhat carbonaceous.
2.5	Claystone		S	Md gn gy																						
1-2	Limestone		G	Md gy to md bn gy																						Biomicrite (possibly some gastropods present).
16	Claystone		G	Md lt gy																						Calcite-filled fractures and limestone nodules.
5.0	Clay shale		G	Md lt to md gy																						
6.5	Sandstone and siltstone		G	Md gy																						Siderite nodules in top 1'.
2.8	Siltstone		S	Md gy																						
4.0	Silty sandstone		G	Md gy																						Faint crossbedding.
4.5	Siltstone - silt-shale		G	Md gy																						Plant fossils common to abundant.
4.5	Silt-clay laminite		G	Md gy to md lt gy																						Plant fossils abundant.
2.0	Silty clay shale		G	Md lt gy																						Plant fossils frequent.
0.5	Claystone - clay shale			Md dk gy																						Plant fossils frequent. Few coaly lenses.

SITE/STATION NO. 57-4 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.7	Coal	1.9	S	Bk	B		X				X	X	MB	1.1	27.7	62.2	9.0	4.9	78.2	1.3	4.0	2.6	13890	8½	2130	Fusain and pyrite partings.
	Coal	1.3	G	Bk	B		X				X	X	M	1.8	27.3	60.6	10.3	4.8	77.3	1.3	5.0	1.3	13660	9	2610	
	Claystone	0.1	S	Ol gy																						Plant fossils abundant.
	Coal	0.6	S	Bk	B		X				X	X	MB	2.0	23.9	48.7	25.4	4.1	62.1	1.1	4.4	2.9	10940	7½	2630	Thin shale and fusain partings.
	Claystone	0.3	S	Bn bk to bk																						Plant fossils abundant.
	Coal	0.5	S	Bk	B				X			X	M	1.6	23.1	46.3	29.0	3.6	54.6	0.8	-	11.1	10040	7	2030	
0.5+	Claystone (underclay)		S	Md lt gy																						

SITE/STATION NO. 57-5
COMPANY: Peles Coal Co.
MINE:
PERMIT: 612-1
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport
COUNTY: Indiana
LAT. °N: 40°28'03"
LONG. °W: 79°09'43"
GEOLOGIST: WAB
DATE: 8-11-71
ELEV. (base lower coal): Appx. 1600'
TWP.: Burrell
15' QUADRANGLE: New Florence
7 1/2' QUADRANGLE: Bolivar
COAL SAMPLE NO(S).: 402803/790947A, 402803/790947B, 402803/790947C
JOINTING: Coal: N68W, N35W, N22E
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (NB), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.5+	Silt shale		G	Gn gy																						Few plant fossils. Grain size coarsens upward.
4.2	Clayey silt shale		S	Dk ol gy and md dk gy																						Few broken plant fossils. Planar bedded.
0.5	Carbonaceous clay shale		S	Vy dk gy to bk																						Few pyrite lenses. Jointed similar to coal.
2.7	Coal	1.1	S	Bk	B		X			X	X		B MB M	1.9	24.2	58.8	15.1	4.5	71.6	1.1	4.9	2.8	12550	8	2080	Few clay lenses.
	Carbonaceous claystone	0.1	S	Bk																						Very soft, putty-like.
	Coal	0.6	S	Bk	B		X				X	X	MB M	2.8	25.3	61.0	10.9	4.7	75.2	1.2	5.5	2.5	13190	9	2100	
	Bone coal	0.2	S	Bk	NB				X				MD D													Homogeneous. Minor sulfur staining.
	Coal	0.7	S	Bk	B		X			X	X		MB M	1.8	26.4	59.9	11.9	4.7	74.8	1.3	5.0	2.3	13240	8½	2520	
-	Claystone			Md dk gy to dk gy																						Mine floor. Underclay.

SITE/STATION NO. 57-6 (page 1)
COMPANY: North Cambria Fuel Co.
MINE:
PERMIT: 10-28
SAMPLING METHOD:
REPORTED COAL NAMES: Lower or Upper Freeport
COUNTY: Indiana
LAT. °N: 40°26'54"
LONG. °W: 79°07'20"
GEOLOGIST: WEE-MAS
DATE: 6-20-74
ELEV. (base lower coal):
TWP.: West Wheatfield
15' QUADRANGLE: New Florence
7 1/2' QUADRANGLE: New Florence
COAL SAMPLE NO(S).: 402654/790720/2A
402654/790720/2B
JOINTING: N79W, N42E; coal: N76W
WEATHERING: Fresh to weathered at top

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
~12	Interbedded limestone and calcareous claystone		?	Md gy																						Severely weathered.
~15	Claystone		G																							Severely weathered, may be same unit as below.
12	Claystone		G	Md gy																						Limestone nodules frequent.
1-2	Claystone (hard clay and semi-hard clay)		G	Md lt gy																						
14	Claystone - clay shale		S	Md ol gy																						Limonite nodules common.
1.1	Silty sandstone		G	Md ol gy																						Plant fossils common; 2 - 3 inch beds.
1.0	Sandstone		S	Lt gy																						Single bed.
8	Silt shale		G	Md gy to lt ol gy																						Some sand laminae.
2.0	Sand-silt laminite		G	Dk gy to md lt gy																						Plant fossils common.
1.0	Claystone			Dk gy to gy bk																						

SITE/STATION NO. 57-6 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mad-bright, mid-lustrous, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.7	Coal	2.6	S	Bk	B		X					X	B	8.4	24.7	57.5	9.4	4.6	69.6	1.2	14.7	0.5	11820	NC	2090	
	Carbonaceous clay shale	0.1	S	Gy bk																						Plant fossils abundant.
	Coal	1.0	S	Bk	B			X				X	MB	2.2	26.6	62.2	9.0	4.8	76.9	1.4	6.0	1.9	13670	9	2460	
1+	Claystone		S	Gy bk																						Plant fossils.

SITE/STATION NO. 65-11 (page 1)
COUNTY: Indiana
COAL SAMPLE NO(S).: 405211/784947/3A, -/3B, -/7, -/9, -/12, -/18A, -/18B
COMPANY: Benjamin Coal Co.
LAT. °N: 40°52'11"
ELEV. (base lower coal): Appx. 1620'
MINE: Benjamin No. 9
LONG. °W: 78°49'47"
TWP.: Bank
PERMIT: 64-16
GEOLOGIST: GBG
15' QUADRANGLE: Punxsutawney
JOINTING: Coal: N83W, N42W, N4E, N7W; shale: N86W, N18W, N20E
SAMPLING METHOD: Channel
DATE: 8-13-69
7 1/2' QUADRANGLE: Burnside
REPORTED COAL NAMES: Lower Kittanning, Middle Kittanning, Upper Kittanning
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
50+	Mostly shale																									Inaccessible for description.
0.5	Clay shale		S	Gy bk																						
2.5	Clay shale		S	Md dk gy																						
2.6	Coal	1.5	S	Bk	N								MB-MD	0.7	25.7	59.9	13.7	4.6	74.5	1.3	4.9	1.0	13050	9	Above 2910	Blocky.
	Claystone	0.1	S	Bk to gy bk																						
	Coal	1.0	S	Bk	B		X				X		B-MB	0.5	26.9	50.6	22.0	4.2	64.3	1.1	2.7	5.7	11550	7½	2190	
4.0	Underclay		S	Dk to md gy																						Plastic.
4.0	Sandstone		G	Lt ol gy																						Plant fossils.
6.0	Interbedded siltstone and claystone		G	Lt ol gy to md dk gy																						Plant fossils.
3.5	Claystone		G	Dk gy																						Few siderite nodules to 1.0'.
6.0	Clay shale		G	Dk gy																						Invertebrate fossils (Lingula sp., Anthraconauta sp., Pectinids). White sulfate powder.
0.5	Clay shale		S	Bk																						

SITE/STATION NO. 65-11 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA — COAL ANALYSIS

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Bonded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.7	Coal		S	Bk	B			X			X	X	MB-MD	0.9	26.3	54.2	18.6	4.5	68.7	1.2	5.2	1.8	12100	8	2620	Clay shale partings to 0.2'.
6.0	Sandstone		S	Md dk gy to ol gy																						Siliceous. Coaly material.
5.5	Clay shale		U	Dk to md dk gy																						Invertebrate fossils (Lingula sp., Anthraconauta sp.). Fish scales. Siderite nodules to 0.3'.
1.05	Coal		S	Bk	B		X				X	X	MB-MD	0.5	29.0	59.8	10.7	4.7	75.7	1.2	2.0	5.7	13560	8½	2080	Pyrite lenses.
2.5	Underclay		S	Lt to vy lt gy																						Plastic.
3.5	Claystone		G	Md dk to md gy																						
4.5	Sandstone		G	Md lt to lt gy																						Siliceous.
2.0	Coal		U	Bk	B		X				X	X	MB-MD	1.1	25.6	56.7	16.6	4.4	70.2	1.1	6.6	1.1	12290	2	2130	
4.0	Underclay		S	Lt to vy lt gy																						Plastic.
20	Claystone		G	Md gy to ol gy																						Plant fossils.

SITE/STATION NO. 65-11 (page 3)
COMPANY:
MINE:
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES:
COUNTY:
LAT. °N:
LONG. °W:
GEOLOGIST:
DATE:
ELEV. (base lower coal):
TWP.:
15' QUADRANGLE:
7 1/2' QUADRANGLE:
COAL SAMPLE NO(S).:
JOINTING:
WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60%	COAL: VITRAIN ABUNDANCE 30-60%	COAL: VITRAIN ABUNDANCE 15-30%	COAL: VITRAIN ABUNDANCE < 15%	COAL: VITRAIN THICKNESS > 5 mm	COAL: VITRAIN THICKNESS 2-5 mm	COAL: VITRAIN THICKNESS 1/2-2 mm	COAL: Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%): MOISTURE	PROXIMATE (%): VOLATILE MATTER	PROXIMATE (%): FIXED CARBON	PROXIMATE (%): ASH	ULTIMATE (%): HYDROGEN	ULTIMATE (%): CARBON	ULTIMATE (%): NITROGEN	ULTIMATE (%): OXYGEN	ULTIMATE (%): SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0-6	Sand-silt laminite		G	Md lt gy																						Replaces top of sandstone below.
18-24	Sandstone		U	Lt gy																						Siderite nodules and bands to 1.0'.
1.0	Clay shale		U	Bk																						
4.0	Coal	3.05	S	Bk	N								MB-MD	0.6	22.4	53.4	23.6	3.9	65.2	1.1	5.4	0.8	11370	4	Above 2910	
	Coal	0.95	G	Bk	B		X				X		B-MB	0.6	27.3	62.1	10.0	4.8	77.5	1.4	4.1	2.2	13670	9	2770	Tough. Canneloid.
3.5	Underclay		S	Md dk to dk gy																						
1.2+	Coal		S		N								MD													Tough. Shaly.

SITE/STATION NO.	65-12	COUNTY:	Indiana		COAL SAMPLE NO(S).: 404927/785027/2
COMPANY:	Arcadia Co.	LAT. °N:	40°49'27"	ELEV. (base lower coal): Appx. 1700'	
MINE:	Clarks	LONG. °W:	78°50'27"	TWP.: Banks	
PERMIT:	164-6	GEOLOGIST:	GBG	15' QUADRANGLE: Punxsutawney	JOINTING: Coal: N83W, N17E, N20W;
SAMPLING METHOD:	Channel	DATE:	8-14-69	7 1/2' QUADRANGLE: Burnside	shale: N34E, N38W
REPORTED COAL NAMES:	Upper Freeport				WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mad-bright, mid-lustraus, mad-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Silt-clay laminite		G	Gn gy to lt ol gy																						Lumpy. Limonite nodules to 0.8'. Flint clay zones.
6.0	Underclay		G	Md lt gy to lt gy																						Limonite nodules to 1.0'.
5.5	Claystone		S	Pale ol																						Limonite nodules to 0.5'.
17.5	Sand silt laminite		S	Gn gy																						Siderite nodules to 0.7'. Upper 3.0' mostly sandstone.
1.8	Clay shale		S	Ol gy to lt ol gy																						0.1' black claystone at base.
2.3	Coal		S	Bk	B		X					X	MB-MD	1.5	29.4	57.4	11.7	4.7	73.3	1.3	6.9	2.1	12930	8	2080	Fusain lenses to 0.1'.
1.0+	Claystone			Md gy																						Mine floor.

SITE/STATION NO. 65-13	COUNTY: Indiana		COAL SAMPLE NO(S).: 405023/784820/6
COMPANY: Lampkie Coal Co.	LAT. °N: 40°50'23"	ELEV. (base lower coal): Appx. 1520'	
MINE:	LONG. °W: 78°48'20"	TWP.: Banks	
PERMIT: 107-5 and 2968BSM13	GEOLOGIST: WEE	15' QUADRANGLE: Punxsutawney	JOINTING:
SAMPLING METHOD: Channel	DATE: 9-23-70	7 1/2' QUADRANGLE: Burnside	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS													
						VITRAIN							PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0+	Clay shale			Ol gy																						
1.0	Clay shale		G	Bk																						
1.7	Coal		S	Bk	B		X					X	M	2.2	25.7	59.7	12.4	4.7	73.6	1.4	7.4	0.5	12830	7	Above 2910	
6.2	Underclay		S	Md lt gy																						Plant fossils.

SITE/STATION NO. 65-14 (page 1)
COMPANY: Lampkie Coal Co.
MINE:
PERMIT: 107-5, 2968BSM13
SAMPLING METHOD: Channel
COUNTY: Indiana
LAT. °N: 40°50'32"
LONG. °W: 78°48'34"
ELEV. (base lower coal): Appx. 1500'
TWP.: Banks
GEOLOGIST: WEE
15' QUADRANGLE: Punxsutawney
DATE: 9/22-23/70
7 1/2' QUADRANGLE: Burnside
COAL SAMPLE NO(S).: 405034/784841/1A, -/1C, -/1E, -/2B, 405032/784834/3D, -/3F
JOINTING: Siltstone and claystone: N28W, N82W, N7W (dip 60SW), N77W, N38E
REPORTED COAL NAMES: Probably all Lower Freeport - WEE
WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL								COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15+	Clay shale		?	Ol gy																						Very weathered.
1±	Coal blossom		?	Bk																						
2±	Underclay		G	Lt ol gy																						Very weathered.
4.5	Clay shale		G	Lt ol gy																						Beds of flat siderite nodules to 0.5'. Top 3.0' stained red.
4.0	Silt shale		G	Lt ol gy																						Beds of flat siderite nodules to 0.5'.
6.5	Sandstone		G	Md lt gy																						Rippled bedding. Beds of flat siderite nodules to 0.5'.
8.0	Silt shale		G	Md gy																						Banded sideritic zones.
13.0	Clay shale		S	Md dk gy																						10% flat siderite nodules to 0.4' x 1.0'. Plant fossils.
0.0-2.0	Coal		S	Bk																						Not accessible. Large discontinuous lens.
0.0-8.0	Clay shale to claystone		S	Ol gy																						Sideritic zones. Wedges out to SE.
0.0-6.0	Sandstone			Vy lt gy																						Very fine to fine grained. Desiccation cracks. Rippled bedding. Very hard. Wedges out to SE.

SITE/STATION NO. 65-15 (page 1)
COMPANY: North Cambria Fuel Co.
MINE: Urey
PERMIT: 10-20
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Freeport, Upper Freeport

COUNTY: Indiana
LAT. °N: 40°50'45"
LONG. °W: 78°49'22"
GEOLOGIST: GBG
DATE: 8-14-69

ELEV. (base lower coal): Appx. 1680'
TWP.: Banks
15' QUADRANGLE: Punxsutawney
7 1/2' QUADRANGLE: Burnside

COAL SAMPLE NO(S).: 405045/784922/2A, 405045/784922/2B, 405045/784922/7
JOINTING: Coal: N82W, N1W, N22E, N20W, N60W; shale: N38W, N56E, N60W, N40W
WEATHERING: Weathered

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0	Sand-silt laminite shale		S	Md dk and md lt gy																						Weathered.
11.0	Claystone		G	Lt gy to dusky yl																						Limonite nodules to 1.0'.
12.0	Underclay		G	Md gy and gn gy																						Limonite nodules to 1.0'. Plastic.
12.0	Claystone		S	Gn gy																						Limonite nodules to 0.5'.
0.7	Sandstone		S	Gn gy																						Siderite nodules to 0.05'.
0.5	Clay shale		S	Gn gy																						
3.5	Sandstone		S	Dusky yl to lt ol gy																						
4.2	Silt shale		G	Gn gy to md gy																						Siderite bands to 0.2'.
6.3	Sand-silt laminite shale		G	Md dk and md lt gy																						Plant fossils.
3.2	Silt-clay laminite shale		G	Dk to md dk gy																						Plant fossils. Siderite bands.
2.3	Clay shale			Dk to md dk gy																						Siderite bands to 1.0'.

SITE/STATION NO. 65-15 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.2	Clay shale		G	Gy bk to dk gy																						Invertebrate fossils (conchostracans).
0.04	Claystone		S	Bk																						
2.4	Coal		S	Bk	B		X				X	X	MB-MD	0.7	27.4	61.2	10.7	4.8	77.0	1.4	4.8	1.3	13600	9	2680	Thin pyrite lenses.
3.5	Underclay		S	Md dk to md lt gy																						Plastic.
0.2	Coal		S	Bk			X				X	X	M-MB													
6.0	Interbedded siltstone and claystone		S	Md dk gy																						
14.0	Silt-sand laminite		S	Ol gy and lt ol gy																						Siderite nodules to 0.3'.
3.5	Claystone		S	Md to md lt gy																						
3.2	Coal		S	Bk	B		X				X	X	MB-MD	1.3	26.5	63.1	9.1	4.6	76.3	1.3	7.7	1.0	13280	2½	Above 2910	
1.3	Underclay		S	Md gy																						Coal lenses. Plant fossils.
1.6	Coal		S	Bk	B		X				X	X	MB-MD	1.0	26.6	63.2	9.2	4.7	76.9	1.2	6.8	1.2	13420	6	Above 2910	
0.5+	Underclay		S	Md dk gy to ol gy																						Plastic. Mine floor.

SITE/STATION NO. 65-16	COUNTY: Indiana			COAL SAMPLE NO(S).: 404729/785440/2A	
COMPANY: Arcadia Co.	LAT. °N: 40°47'29"	ELEV. (base lower coal): Appx. 1820'		404729/785440/2B	
MINE: Walker & Veytus	LONG. °W: 78°54'40"	TWP.: Grant			
PERMIT: 164-10	GEOLOGIST: GBG	15' QUADRANGLE: Punxsutawney		JOINTING: Coal: N59W, N24E	
SAMPLING METHOD: Channel	DATE: 8-14-69	7 1/2' QUADRANGLE: Rochester Mills			
REPORTED COAL NAMES: Lower Freeport (Probably Upper Freeport -GBG)				WEATHERING: Weathered	

STRATIGRAPHIC DATA													COAL ANALYSIS													
					COAL								PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	>60%	30-60%	15-30%	<15%	>5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Underclay			Lt gy to vy lt gy																						Plastic.
4.0	Siltstone		G	Gn gy																						Irregular bedding.
13.0	Sandstone		S	Gn gy																						Irregular bedding.
18.0	Siltstone		G	Gn gy																						Limonite bands to 0.2'.
14.0	Siltstone		G	Md dk gy to md gy																						Siderite bands to 0.1'.
3.0	Silt-clay laminite		G	Md dk gy to md gy																						Siderite nodules and bands to 0.05'. Plant fossils.
8.0	Claystone		S	Md dk gy to dk gy																						Siderite nodules to 0.2'.
4.7	Bone to shaly coal	0.8	S	Bk	N								M-MD	1.0	20.7	37.6	40.7	3.4	48.6	0.9	5.2	1.2	8440	2	Above 2910	Shale partings.
	Coal	3.9	S	Bk	B		X			X	X		MB	1.0	27.4	60.7	10.9	4.8	76.5	1.4	5.5	0.9	13450	9	Above 2910	Thin shale partings.
0.5	Underclay		S	Md dk gy																						Mine floor.

SITE/STATION NO. 65-17 (page 1)	COUNTY: Indiana		COAL SAMPLE NO(S).: 404844/785405/2A 404844/785405/2B
COMPANY: Arcadia Co.	LAT. °N: 40°48'44"	ELEV. (base lower coal): Appx. 1700'	
MINE: Arcadia No. 1	LONG. °W: 78°54'05"	TWP.: Montgomery	
PERMIT: 164-9	GEOLOGIST: GBG	15' QUADRANGLE: Punxsutawney	JOINTING: Coal: N72W, N65W, N30E, N10E; shale: N70W, N24E
SAMPLING METHOD: Channel	DATE: 1969	7 1/2' QUADRANGLE: Rochester Mills	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0±	Coal blossom			Bk																						
3.0	Cover																									May be nodular limestone (float).
5.0	Underclay			Md lt gy to vy lt gy																						Flint clay near top.
17.5	Clay shale		G	Ol gy																						Limonite nodules. Siltier upward.
1.3	Coal		S	Bk	B			X			X	X	MB-MD													Fusain and clay shale partings to 0.1'.
4.5	Underclay		S	Md dk gy to md lt gy																						
13.5	Claystone		G	Gn gy																						Limonite nodules to 0.5'.
0.5	Interbedded coal and clay shale		G	Bk																						
7.5	Claystone		S	Md dk gy to gn gy																						Few siderite nodules.
7.0	Sandstone		S	Lt gy																						Crossbedded. Siliceous. Sole markings.
7.0	Interbedded sandstone and silt shale		S	Md dk gy and lt ol gy																						

SITE/STATION NO. 65-17 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
14.0	Sand-silt laminite		G	Md dk gy to md lt gy																						Plant fossils.
2.35	Coal	1.05	S	Bk	B		X				X	X	M-MD	0.7	27.4	58.5	13.4	4.7	74.3	1.2	4.0	2.4	13140	9	2460	
	Bone	0.1	S	Bk																						
	Coal	1.2	S	Bk	B		X				X	X	M-MD	0.7	29.6	59.1	10.6	4.9	77.1	1.3	3.8	2.3	13590	9	2280	Thin partings.
0.5+	Underclay			Md dk gy																						Mine floor. Plastic.

SITE/STATION NO. 65-18	COUNTY: Indiana		COAL SAMPLE NO(S).: 404657/785416/2A 404657/785416/2B
COMPANY:	LAT. °N: 40°46'57"	ELEV. (base lower coal): Appx. 1750'	
MINE: Kraynak mine, Gromley mine	LONG. °W: 78°54'16"	TWP.: Grant	
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Punxsutawney	JOINTING:
SAMPLING METHOD: Channel	DATE: 1970	7 1/2' QUADRANGLE: Rochester Mills	
REPORTED COAL NAMES: Lower Freeport, Upper Freeport			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.5	Coal			Bk																						Weathered exposure.
25	Cover																									
2.0	Silt shale			Dk gy																						
3.3	Coal	0.9	S	Bk	B				X			X	M	4.3	27.7	59.4	8.6	5.1	75.0	1.3	8.1	1.9	8.6	8½	2440	
	Coal	2.4	S	Bk	B			X				X	M	0.7	30.1	62.1	7.1	5.0	79.9	1.4	4.9	1.7	14190	9	2680	Thin pyrite parting at top.
0.3+	Underclay		S	Md lt gy																						Mine floor.

SITE/STATION NO. 65-19	COUNTY: Indiana			COAL SAMPLE NO(S).: 405114/785821	
COMPANY: S. C. Monnie Coal Co.	LAT. °N: 40°51'11"	ELEV. (base lower coal): Appx. 1380'			
MINE:	LONG. °W: 78°58'20"	TWP.: Canoe			
PERMIT: 58-10A	GEOLOGIST: WAB	15' QUADRANGLE: Punxsutawney		JOINTING: Coal: N61W, N37E	
SAMPLING METHOD: Channel	DATE: 8-18-71	7 1/2' QUADRANGLE: Rochester Mills			
REPORTED COAL NAMES: Upper Freeport				WEATHERING: Fresh	

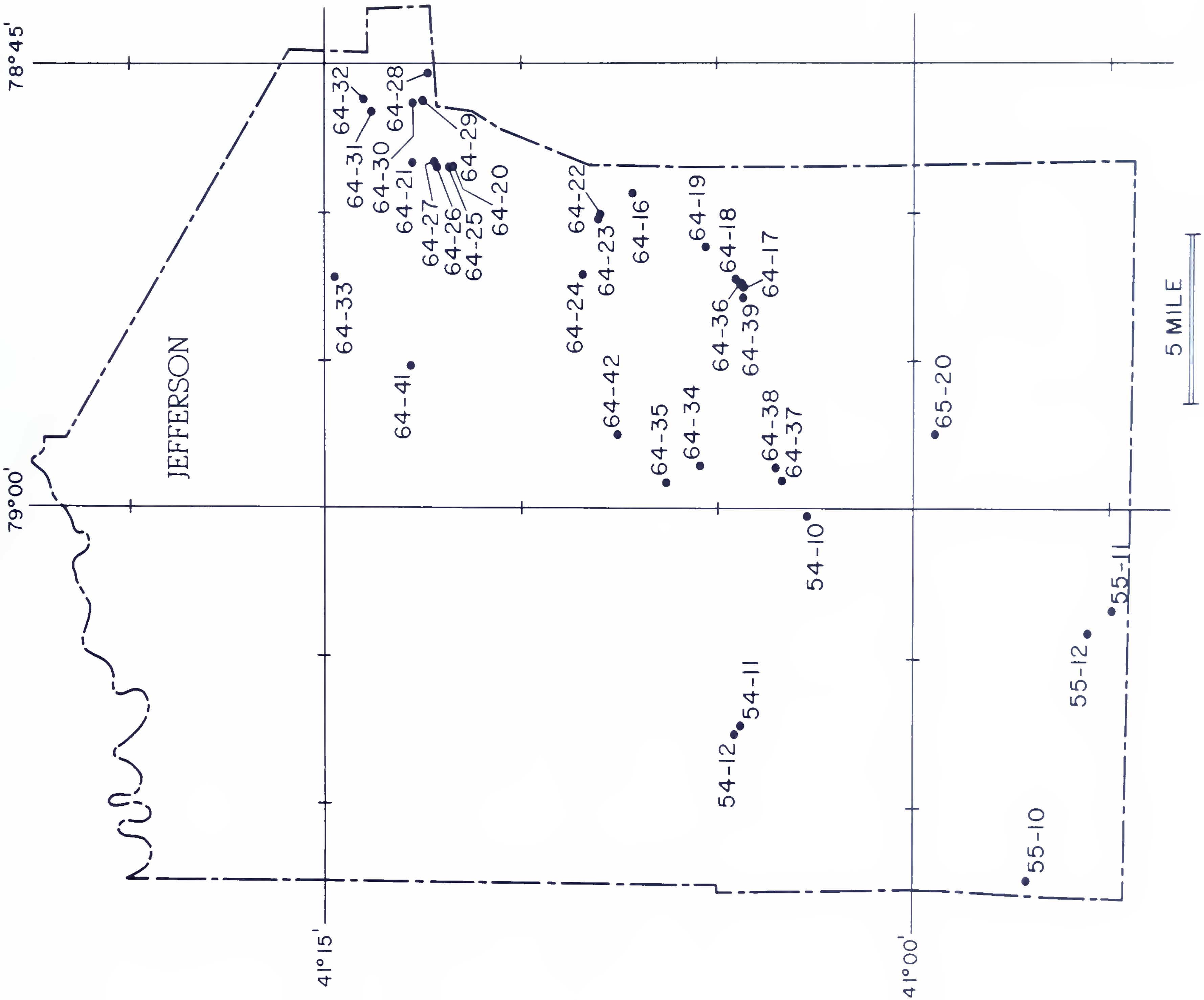
STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Unconf.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0	Fissile sandstone		G	Lt bl gy, md lt gy																						Very fine to medium grained. Highly micaceous. Sand size increases up. Platy fracture.
15.9	Silt shale		S	Md dk gy to md gy																						Plant fossils abundant. Micaceous. Platy fracture.
4.1	Coal		S	Bk	B		X			X	X	X	M MD	1.0	31.4	59.3	8.3	5.1	78.2	1.5	4.5	2.4	13960	8½	2170	Pyrite common. Few nonpersistent carbonaceous shale lenses.
-	Claystone			Md dk gy to lt gy																						Mine floor. Underclay. Few rootlets.

SITE/STATION NO. 66-4 (page 1)	COUNTY: Indiana		COAL SAMPLE NO(S).: 403212/785601A, 403212/785601B, 403413/785606A, 403413/785606B		
COMPANY: Valley Coal Co.	LAT. °N: 40°34'12"	ELEV. (base lower coal): Appx. 1660'			
MINE:	LONG. °W: 78°55'58"	TWP.: Pine			
PERMIT: 95-1A2	GEOLOGIST: WAB	15' QUADRANGLE: Barnesboro	JOINTING: LF Coal: N17E, N76W; siltstone above LF coal: N52E, N68W; UF Coal: N68W		
SAMPLING METHOD: Channel	DATE: 8-11-71	7 1/2' QUADRANGLE: Strongstown			
REPORTED COAL NAMES: Lower Freeport and Upper Freeport			WEATHERING: Fresh		

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
															Top of highwall											
8.0+	Sandy siltstone to sandstone		S	Or. red to yl red																						Contains fragments of underlying unit, and fragments of silt are included in underlying unit.
11.8	Sandstone		S	Red to red gy																						Festoon crossbedding -- irregular lower surface. Medium sand to pebbles (up to ½"). Finer grained upward.
3.2	Claystone		G	Mottled or. and gn																						Ancient soil horizon. Soft, plastic.
31.0	Silt shale		S	Md gy to md lt gn gy																						Few broken plant fossils. Green gray only in upper 2.0'.
4.9	Silt shale to clay shale		S	Md dk to dk gy																						Plant fossils. Fairly planar bedding.
3.2	Coal	0.5	S	Bk	B			X		X			B-MB	0.9	25.0	52.1	22.0	4.0	63.9	1.1	2.2	6.8	11400	7½	2240	Few pyrite lenses.
	Claystone	0.4	S	Md dk gy																						Seat earth. Internally slumped.
	Coal	2.3	S	Bk	B			X			X		M-MB	0.7	27.5	60.8	11.0	4.6	76.4	1.3	3.3	3.4	13500	8½	2130	Few nonpersistent shaly lenses.
3.2	Claystone			Md dk to md lt gy, yl gy																						Underclay, rooted.

SITE/STATION NO. 66-4 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA													COAL ANALYSIS												
					COAL								PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																			
						ABUNDANCE				THICKNESS															
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
11.5	Clayey silt shale		G	Md to md lt gy																						Plant fossils common. Planar bedding.
0.4	Carbonaceous clayey siltstone		S	Bk to vy dk gy																						Broken plant fossils. Fractures along joints. Pyrite lenses.
22.0	Sandstone		S	Lt to md lt gy																						Unit not accessible.
3.1	Silt shale		S	Dk to md dk gy																						Planar bedded.
4.8	Siltstone		S	Vy dk to md dk gy																						Broken plant fossils common.
2.6	Interbedded silt and sand		S	Md dk to lt gy																						Very fine to fine-grained sand. Broken plant fossils.
4.0	Carbonaceous claystone	0.3	S	Vy dk gy										0.4	17.3	48.5	33.8	3.3	57.2	0.9	3.7	1.1	9880	1½	Above 2910	Blocky. Fractures along joint planes.
	Coal	3.7	S	Bk	B	X				X			B-MB	1.0	25.3	64.7	9.0	4.7	78.8	1.4	3.8	2.3	13930	9	2250	0.1' carbonaceous clay shale band 1.0' above base. Pyrite lenses present throughout.
-	Carbonaceous clay shale		S	Vy dk to dk gy																						Mine floor.


78°45'
79°00'
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JEFFERSON
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55-10

SITE/STATION NO. 54-10	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410258/790023/2A, 410258/790023/2B, 410258/790023/2C
COMPANY: Krach & Gearhart	LAT. °N: 41°02'58"	ELEV. (base lower coal): Appx. 1800'	
MINE:	LONG. °W: 79°00'23"	TWP.: McCalmont	
PERMIT: 112-9	GEOLOGIST: ADG	15' QUADRANGLE: Brookville	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-16-71	7 1/2' QUADRANGLE: Coolspring	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
12.0	Clay shale		S	Dusky yl, lt ol bn																						Soil developed on top. Reddish stain in upper 3'.
20.0	Sandstone		S	Gys yl																						Fine grained. Even bedding.
12.0	Sandstone		U	Lt gy																						Medium to coarse grained. Some crossbedding. Carbonaceous material common. Locally cuts through unit below.
10.0	Silt shale		G	Md gy																						Fine plant hash common. Siderite nodules rare.
0.3	Clay shale		S	Md gy																						
3.35	Coal	0.7	S	Bk	B			X				X	M-MD	1.5	34.5	53.1	10.9	5.1	73.5	1.3	7.0	2.2	13150	9	2570	
	Coal	1.0	S	Bk	B		X					X	M-MB	1.5	37.1	56.0	5.4	5.4	78.7	1.4	6.7	2.4	14170	8½	2100	
	Coal	1.65	S	Bk	B		X				X	X	M-MB	1.6	32.3	52.9	13.2	4.9	71.7	1.3	7.0	1.9	12940	8½	2140	
0.3+	Claystone			Md ol gy																						Stigmaria and slickensides common. Mine floor.

SITE/STATION NO. 54-11	COUNTY: Jefferson			COAL SAMPLE NO(S).: 410438/790722/1A, 410438/790722/1B	
COMPANY: Baughman Coal Co.	LAT. °N: 41°04'38"	ELEV. (base lower coal): Appx. 1540'			
MINE:	LONG. °W: 79°07'22"	TWP.: Rose			
PERMIT: 151-48	GEOLOGIST: ADG	15' QUADRANGLE: Brookville		JOINTING:	
SAMPLING METHOD: Channel	DATE: 9-8-71	7 1/2' QUADRANGLE: Summerville			
REPORTED COAL NAMES: Middle Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Sandstone		S	Yls gy																						Soil developed on top. Fine to very fine grained. Highly weathered.
7.0	Clay shale		S	Md gy																						
	Coal	1.1	S	Bk	B				X			X	M-MD	6.9	28.9	58.5	5.7	5.1	73.5	1.3	13.6	0.8	12740	2	2830	Weathered.
2.9	Claystone	0.5	S	Dk gy																						*Stigmaria* and slickensides common. Yellowish sulfur stain.
	Coal	1.3		Bk	B		X					X	M-MB	3.2	29.8	54.3	12.7	4.9	70.5	1.4	9.4	1.1	12450	7	-	

SITE/STATION NO. 54-12	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410441/790742/2A, 410441/790742/2B
COMPANY: Baughman Coal Co.	LAT. °N: 41°04'41"	ELEV. (base lower coal): Appx. 1500'	
MINE:	LONG. °W: 79°07'42"	TWP.: Beaver	
PERMIT: 151-48	GEOLOGIST: ADG	15' QUADRANGLE: Brookville	JOINTING: Clay shale: N33W, N52W, N44W; coal: N70W, N25E
SAMPLING METHOD: Channel	DATE: 9-8-71	7 1/2' QUADRANGLE: Summerville	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal crop (Middle Kittanning)																									Note: Highwall inaccessible above clay shale.
2.0	Claystone		S	Ol gy																						
5.0	Sandstone		G	Vy lt gy																						Fine grained.
23.0	Clay shale		G	Dk gy																						Marine fossils 5 - 7' above base. Few plant fragments in lower part. Siderite nodules common in lower part.
2.5	Bony coal	1.5	S	Bk	B				X			X	M-MD	1.5	36.9	49.0	12.6	5.2	72.5	1.5	7.6	0.6	13020	8	-	Tough.
	Coal (Lower Kittanning)	1.0	S	Bk	B		X				X		M-MB	3.4	32.9	59.1	4.6	5.3	78.4	1.5	9.5	0.7	13960	9	-	½" carbonaceous clay lenses with fusain 3" above base.
0.2+	Claystone		S	Mod bns gy																						Stigmaria and slickensides common. Carbonaceous plant material. Mine floor.

SITE/STATION NO. 55-10	COUNTY: Jefferson		COAL SAMPLE NO(S).: 405717/791233
COMPANY: Markle-Buller Coal Co.	LAT. °N: 40°57'17"	ELEV. (base lower coal): Appx. 1540'	
MINE:	LONG. °W: 79°12'33"	TWP.: Porter	
PERMIT: 504-14	GEOLOGIST: ADG	15' QUADRANGLE: Smicksburg	JOINTING: Coal: N60W, N72W, N17E
SAMPLING METHOD: Channel	DATE: 9-8-71	7 1/2' QUADRANGLE: Dayton	
REPORTED COAL NAMES: Upper Freeport?			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16	Sandstone			Dusky yl white																						Soil developed on top. Fine to coarse grained. Rare crossbedding. Occasionally cuts into unit below.
8	Silt shale		U	Ol gy																						Plant hash rare. Few thin very fine sand laminae at base.
4.5	Carbonaceous shale	1.0	S	Bk	B				X			X	MD-D													Plant fragments common.
	Coal	3.5	S	Bk	B		X				X	X	M-MB	2.4	34.7	55.5	7.4	5.3	76.8	1.4	7.4	1.7	13710	9	2470	Few clay partings in upper 0.5'.
0.3+	Claystone		S	Md to md lt gy																						*Stigmaria* and slickensides common. Mine floor.

SITE/STATION NO. 55-11	COUNTY: Jefferson	COAL SAMPLE NO(S).: 405508/790336
COMPANY: P & N Coal Co.	LAT. °N: 40°55'08" ELEV. (base lower coal): Appx. 1300'	
MINE:	LONG. °W: 79°03'33" TWP.: Perry	
PERMIT: 32-44	GEOLOGIST: WAB 15' QUADRANGLE: Smicksburg	JOINTING: Coal: N63W, N43E
SAMPLING METHOD: Channel	DATE: 8-18-71 7 1/2' QUADRANGLE: Valier	
REPORTED COAL NAMES: Upper Kittanning		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Sandstone		S	Bn gy																						Medium sand to granules. Log impressions. Few pebbles up to ½". Crossbedded.
3.0	Coal		S	Bk																						Lower Freeport? Unit not accessible for sample.
4.0	Claystone		G	Md dk to md lt gy, gn gy																						Soft, plastic. Underclay.
7.6	Silt shale		G	Gn gy																						Planar bedded; minor flaser bedding.
8.3	Sandstone		G	Md lt to md gy, bl gy																						Very fine to medium grained, bedding fairly planar. Few broken plant fossils.
6.7	Silt shale		G	Md dk to md gy, gn gy																						Few broken plant fossils. Flaser bedded.
4.5	Clayey siltstone		S	Md dk to md gy, gn gy																						Rooted. Internal slumping common.
2.5	Coal		S	Bk	B		X				X		MD D	0.8	29.4	56.5	13.3	4.6	73.3	1.2	3.5	4.1	13090	8½	2140	Few thin carbonaceous clay shale lens in lower 1.0'.
-	Silty claystone			Md dk to md gy																						Mine floor. Hard to semi-hard underclay. Rooted.

SITE/STATION NO. 55-12	COUNTY: Jefferson		COAL SAMPLE NO(S).: 405548/790420
COMPANY: P & N Coal Co.	LAT. °N: 40°55'46"	ELEV. (base lower coal): Appx. 1300'	
MINE:	LONG. °W: 79°04'18"	TWP.: Perry	
PERMIT: 32-40	GEOLOGIST: WAB	15' QUADRANGLE: Smicksburg	JOINTING: Coal: N70W, N26E; shale: N25E
SAMPLING METHOD: Channel	DATE: 8-18-71	7 1/2' QUADRANGLE: Valier	
REPORTED COAL NAMES: Middle Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Silt shale		S	Md lt to md dk gy																						Broken plant fossils. Coarser grained upward.
2.0	Silty clay shale		G	Dk gy to gy bk																						Few carbonized stems. Slightly irregular upper contact.
25.0	Clayey silt shale		S	Dk to md lt gy																						Abundant plant fragments. Subplanar bedding.
2.2	Coal		S	Bk	B		X				X	X	MD	2.0	28.6	56.5	12.9	4.8	73.2	1.3	6.2	1.6	12930	8½	2730	Few pyrite lenses.
-	Carbonaceous clay shale			Dk to md gy																						Mine floor. Plant fossils (stems) and coaly lenses present.

SITE/STATION NO. 64-16	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410714/784926/1A,
COMPANY: Doan Coal Co.	LAT °N: 41°07'14"	ELEV. (base lower coal): Appx. 1460'	410714/784926/1B, 410714/784926/1C
MINE:	LONG. °W 78°49'26"	TWP.: Winslow	
PERMIT: 154-8	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: DuBois	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
13.0+	Clay shale - claystone		U	Md gy																						Soil developed on top. Thin sandstone interbeds. Locally cuts out unit below.
0-2.1	Sandstone		S	Md lt gy																						Medium to coarse grained. Solid bed.
7.2	Coal	1.8	S	Bk			X				X		M-MB	1.0	34.2	54.2	10.6	5.1	74.1	1.4	7.3	1.5	13280	8½	2340	
	Shale parting	0.3	S	Bk																						
	Coal	2.6	S	Bk	B			X			X		M-MD	1.2	32.2	60.1	6.5	5.0	79.4	1.6	6.5	1.0	14000	6	2830	
	Coal	2.5		Bk	B			X			X	X	M-MB	1.0	33.6	61.4	4.0	5.3	82.4	1.6	5.0	1.7	14600	8½	2190	

SITE/STATION NO.	64-17	COUNTY: Jefferson		COAL SAMPLE NO(S).:	410428/785229/A, B, C, D, E
COMPANY:	Armagost Coal Co.	LAT. °N: 41°04'28"	ELEV. (base lower coal): Appx. 1550'		
MINE:	Miller Strip	LONG. °W: 78°52'29"	TWP.: Winslow		
PERMIT:	484-1c	GEOLOGIST: TMB	15' QUADRANGLE: DuBois	JOINTING:	
SAMPLING METHOD:	Channel	DATE: 8-21-69	7 1/2' QUADRANGLE: DuBois		
REPORTED COAL NAMES:	Lower Freeport			WEATHERING:	Moderately weathered

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	Vitrain abundance >60%	Vitrain abundance 30-60%	Vitrain abundance 15-30%	Vitrain abundance <15%	Vitrain thickness >5 mm	Vitrain thickness 2-5 mm	Vitrain thickness 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Surface																									
10.0	Claystone		G	Mod gys yl																						Vertically homogeneous; hackly.
2.0	Interbedded coal and clay		G	Bk and mod gys yl																						Chippy, hackly; transition zone.
7.8	Coal	1.40		Bk	B			X			X	X	MB-MD	1.8	31.0	59.0	8.2	5.0	76.0	1.4	8.5	0.9	13370	4½	Above 2910	Cubic fracture; many fusain partings.
	Bone coal	0.10		Bk																						Parting.
	Coal	0.80		Bk	B		X					X	D-MD	1.7	28.2	55.9	14.2	4.6	70.6	1.3	8.5	0.8	12350	3	Above 2910	Blocky fracture; many fusain partings.
	Bone coal	0.05		Bk																						Parting; abundant fusain.
	Coal	2.65		Bk	B		X	X			X	X	M-D	1.4	30.5	61.3	6.8	4.9	78.4	1.6	7.5	0.8	13680	4½	2780	Rough to blocky fracture; cubic and bony at top; discontinuous fusain partings; up to 2" fusain at base.
	Coal	1.20		Bk	B	X						X	MB-MD	1.6	31.5	61.3	5.6	5.1	78.9	1.6	8.0	0.8	13900	7	2260	Rough to blocky fracture; few fusain partings.
	Coal	1.60	S	Bk	B	X					X	X	M-MD	1.7	29.7	61.0	7.6	5.0	76.6	1.5	8.1	1.2	13440	5½	2730	Rough to blocky fracture; few fusain partings.
1.0+	Underclay			Dk gy																						Hackly; rootlets.

SITE/STATION NO. 64-18	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410433/785222/2A,
COMPANY: Sugar Hill Limestone Co.	LAT. °N: 41°04'33"	ELEV. (base lower coal): 1520'±	410433/785222/2B
MINE:	LONG. °W: 78°52'22"	TWP.: Winslow	
PERMIT: 496	GEOLOGIST: JDI-ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Face channel	DATE: 4-24-74	7 1/2' QUADRANGLE: DuBois	
REPORTED COAL NAMES: Upper Kittanning (C')			WEATHERING: Moderately weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)										
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Clay shale			Md dk to md gy																						Siderite bands and nodules common. Plant stems and leaves common.
1.85	Coal	0.5	S	Bk	B	X				X	X	X	MB-B	1.7	31.9	54.7	11.7	4.9	73.4	1.3	3.9	4.8	13070	8½	2030	
	Bone	0.1		Gy bk																						
	Coal	1.25		Bk	B		X			X	X		D-MD	1.0	32.9	51.2	14.9	4.8	71.8	1.4	5.5	1.6	12850	7	2630	Pyrite frequent.
	Claystone (underclay)		S	Pinkish gy bn																						Rootlets common.

SITE/STATION NO.: 64-19 (page 1)
COMPANY: Pa. Geologic Survey
MINE:
PERMIT: Drill Hole no. 4
SAMPLING METHOD: Drill Core Samples
REPORTED COAL NAMES:

COUNTY: Jefferson
LAT. °N: 41°05'22"
LONG. °W: 78°51'15"
GEOLOGIST: WAB, ADG
DATE: 2-8-71

ELEV. (base lower coal):
TWP.: Winslow
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: DuBois

COAL SAMPLE NO(S).: 64-C-16 through 64-C-21
JOINTING:
WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60 %	30-60 %	15-30 %	< 15 %	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19.1	Surface material		C																							No recovery.
2.1	Clay shale		G	Dusky yl, lt ol gy																						Unit broken in box.
3.3	Silty clay shale		G	Md lt to dk gy																						Core broken in box. Invertebrate fossils (2 *Lingula* sp.) in lower 0.1'. Possible plant fossil (*Lepidodendron rigens*).
12.8	Silt shale		G	Md to dk gy																						Plant fossils abundant in lower part. Siderite nodules rare. Clay lenses common.
2.9	Clay shale		S	Md to md dk gy																						Plant fragments rare, mostly carbonized stems. Rare pyrite lenses.
0.7	Coal and carbonaceous clay shale (Middle Kittanning rider)		S	Bk to gys bk	B							X	B-MB													Coal broken in core box. Thickness obtained from field log.
19.1	Sand-silt laminite shale		G	Dk to lt gy																						Very fine grained. Plant fragments abundant. Limonite nodules and lenses rare.
3.7	Clay shale		G	Md dk gy																						Rare carbonized plant hash. Siderite nodules rare.
0.2	Clay shale			Bk to gys bk																						Rare coalified plant remains. Yellow-white sulfur staining.

SITE/STATION NO. 64-19 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE				VITRAIN THICKNESS			Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm														
1.5	Coal (Middle Kittanning)	1.3	S	Bk	B		X				X		M-MB	0.8	31.7	61.2	6.3	5.2	80.2	1.5	6.0	0.8	14290	9	-	Fusain partings.
	Clay shale	0.1	S	Bk to gys bk																						Coalified plant material. Slickensides common.
	Coal	0.1	S	Bk	B		X				X		M-MB	1.1	24.8	47.0	27.1	4.0	59.4	1.1	5.7	2.7	15060	7½	2680	Pyrite nodules common. Fusain partings and sulfur stains.
3.0	Claystone		S	Lt to dk gy, md ol gy																						Roots and slickensides abundant.
4.1	Silty claystone		G	Gns gy, md bls gy																						Roots in upper 0.2'. Siderite veinlets common. Hard.
7.0	Sand-silt laminite shale		G	Md bls gy																						Very fine grained. Cross laminated. Plant fragments rare in lower part. Siderite common.
3.1	Clayey siltstone		G	Md dk to dk gy																						Siderite nodules common. Slickensides present. Churned bedding.
2.3	Silt shale		G	Md dk to dk gy																						Invertebrate fossils (Lingula sp.) in lower 0.4'.
0.7	Sandstone		G	Md dk to dk gy, lt ol gy																						Fine to very fine grained. Siderite nodules abundant in sandstone matrix.

SITE/STATION NO. 64-19 (page 3)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.1	Silt shale		G	Md dk to dk gy and lt gy																						Marine fossils abundant in lower half. Sand lenses and laminae present.
1.1	Clay shale		G	Md dk gy																						Invertebrate fossils (Mesolobus sp.) common throughout.
2.4	Silt shale		G	Dk to md dk gy																						Abundant marine fossils. Siderite nodules common.
11.3	Silty clay shale		G	Dk to md dk gy																						Marine fossils common. Plant fossils (Pecopteris) rare. Siderite nodules and bands common.
2.2	Clay shale		G	Md dk gy to gys bk																						Invertebrate fossils (Lingula) common in upper foot. Plant fragments near base. Pyrite nodules abundant in upper 6".
0.6	Coal (Lower Kittanning No. 3)		S	Bk	B		X				X		D-MD	1.1	24.2	33.8	40.9	3.4	46.4	0.9	6.7	1.7	8280	5½	2730	Many thin clay shale partings.
1.5	Silty clay shale		S	Md dk gy																						Plant fossils abundant, some coalified and carbonized.
4.9	Sand-silt laminite shale		S	Md dk to lt gy																						Very fine grained. Cross laminations common. Plant hash common.

SITE/STATION NO. 64-19 (page 4)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.5	Silt-clay laminite shale		G	Md to dk gy																						Carbonized plant remains common.
0.3	Coal (Lower Kittanning No. 1)		S	Bk	B			X			X		M- MD	0.8	25.2	48.3	25.7	3.6	60.7	1.0	4.5	4.5	10890	5½	2250	
0.1	Silt shale		S	Dk gy to bk																						Coalified plant remains common.
0.7	Clay shale		G	Md dk gy to gys bk																						Carbonized and vitrinized plant roots and stems abundant. Abundant slickensides.
2.3	Claystone		G	Md dk to md lt gy, lt ol gy																						Abundant carbonized roots. Abundant slickensides. Hard plastic clay (underclay).
3.9	Siltstone		G	Lt gy, lt ol gy																						Carbonized roots common. Slickensides present.
1.5	Silt-clay laminite shale		G	Md gns gy																						Siderite oolites scattered throughout.
8.0	Silt-clay laminite shale		G	Md dk to md lt gy, dk gns gy																						Lensoidal laminae.
1.9	Clay shale		G	Gys bk to md dk gy, dk gns gy																						Slickensides common near base. Carbonaceous -- probably represents rider coal horizon.

SITE/STATION NO. 64-19 (page 5)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.4	Silty claystone		G	Lt ol gy and md bls gy																						Root casts rare.
0.2	Clay shale		S	Gys bk to dk gy																						Slickensides common. Carbonaceous.
1.8	Siltstone		S	Md lt to lt gy, md ol gy																						Few root casts and carbonized lenses near base.
3.0	Claystone		G	Gns to dk gns gy																						Roots rare. Oolitic siderite in lower 2'.
1.9	Clay shale		G	Dk gns gy																						Desiccation cracks.
0.5	Silty claystone		G	Md bls gy and bns gy																						Abundant siderite or iron oxide oolites in layers and disseminated. Calcareous.
1.5	Silt-clay laminite shale		G	Dk gns gy																						
0.8	Claystone		G	Md bls gy																						Oolitic siderite up to 30%. Some oolites are layered.
13.2	Clay shale		G	Md to md dk gy and md gns gy, md bls gy																						Invertebrate fossils (*Linoproductus* sp., *Nucula* sp., and *Mesolobus* sp.) common in lower foot.

SITE/STATION NO. 64-19 (page 6)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.3	Claystone		G	Md dk gy																						Marine invertebrate fossils common (Mesolobus sp., Aviculopectin sp.).
1.3	Limestone (Vanport)		S	Md lt gy and md bns gy																						Abundant marine fossils, (Mesolobus sp., crinoid stems). Extremely hard.
2.2	Silty clay shale		S	Md dk gy																						Slickensides common in lower 0.5'.
0.9	Claystone		G	Md dk gy																						Abundant slickensides.
1.0	Siltstone		G	Md dk gy																						Carbonized plant stems, abundant.
2.3	Silt shale		G	Md dk to md gy																						Carbonized plant stems and fragments common. Siderite bands common.
2.5	Siltstone		G	Dk to md gy																						Plant fragments and coalified stringers toward base. Irregular patches and bands of siderite common.
5.9	Sand-silt laminite shale		G	Dk to lt gy																						Very fine - fine grained. Carbonized plant fragments abundant. Siderite nodules and bands common.
9.9	Silt-clay laminite shale		G	Dk to md gy																						Plant fragments more common near top and bottom. Siderite bands common.

SITE/STATION NO. 64-19 (page 7)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.2	Coal (Clarion No. 1)		S	Bk	B			X			X		M-MD	0.6	32.8	45.3	21.3	4.3	62.5	1.1	0.5	10.3	11620	8	2090	Pyrite nodules present.
1.5	Siltstone		S	Dk to md gy																						Carbonized plant stems more abundant near top.
2.0	Sand-silt laminite shale		G	Dk to md dk gy and md lt to lt gy																						Very fine - fine grained. Carbonized plant hash abundant in silt laminae.
5.1	Silt shale		G	Dk to md gy																						Carbonized plant hash common. Very fine sandy lenses near top.
0.7	Silt-clay laminite shale		G	Dk to md gy																						Carbonized plant hash rare.
1.1	Clay shale		G	Dk to md gy																						Carbonized plant fragments common. Lower 0.1' black.
0.7	Silt shale		S	Dk to md dk gy																						Abundant plant hash.
1.2	Sand-silt laminite shale		G	Dk to md dk gy																						Very fine to fine grained. Carbonized plant hash common. Slight cross lamination.
3.3	Silty clay shale		G	Md dk gy																						Carbonized plant fragments common. Siderite bands common in upper 1.5'.

SITE/STATION NO. 64-19 (page 8)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60 %	30-60 %	15-30 %	< 15 %	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.4	Claystone		G	Dk to md dk gy																						Abundant coalified and carbonized plant remains. Small slickensides common.
0.4	Coaly clay shale		G	Bk to dk gy	B			X			X	X	D-MD													Abundant coalified and carbonized plant remains. Coaly lenses common.
1.0	Claystone		S	Md dk to md lt gy																						Soft, plastic underclay. Roots common. Slickensides common.
1.5	Siltstone		G	Md ol gy																						Roots common. Slickensides common.
1.5	Claystone		G	Md ol gy																						Rare root casts. Semi-hard clay.
4.3	Silt shale		G	Md to md dk gy, md gns gy, md bls gy																						Some cross laminations. Rare plant fragments. Rare siderite patches.
6.0	Clay shale		G	Md to md dk gy and md bls gy																						Plant stems and leaves common in lower half. Two siderite layers up to 6" thick.
4.2	Claystone		G	Dk to md gy																						Plant fragments common in upper 1.5'. Underclay.
2.6	Claystone		G	Lt ol gy																						Semi-hard clay.

SITE/STATION NO. 64-19 (page 9)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60 %	VITRAIN ABUNDANCE 30-60 %	VITRAIN ABUNDANCE 15-30 %	VITRAIN ABUNDANCE < 15 %	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.9	Clay shale		G	Md dk gns gy																						Irregular laminae. Rare possible roots.
4.1	Sideritic sandstone		S	Dk to md dk gy and bns gy																						Medium to coarse grained. Oolitic and crystalline siderite. Extremely hard.
5.0	Clay shale		S	Gys bk to md dk gy and ol gy																						Plant stems and fragments common in upper foot and lower 3". Siderite nodules to 2" thick common.
2.5	Coal (Upper Mercer)	1.4	S	Bk	B		X				X		M-MD	0.7	30.6	55.2	13.5	4.6	73.1	1.1	3.4	4.3	13060	5½	2140	Slaty. Tough. Thin pyrite streaks, white sulfur stains.
	Coal	0.4	S	Bk	N				X			X	D-MD	0.6	20.5	36.7	42.2	2.8	48.1	0.6	5.2	1.1	8400	1	-	Tough. Bony. Pyrite nodules.
	Coal	0.55	S	Bk	B			X				X	M-MD	0.7	29.8	52.8	16.7	4.4	66.9	1.0	3.1	7.9	12250	7½	2130	Pyrite nodules with yellow sulfur stain.
	Shaly coal	0.15	S	Bk	B				X			X	D-MD	0.7	26.7	43.2	29.4	3.9	57.1	0.9	4.3	4.4	10330	7	2620	Thin clay shale parting near top.
2.4	Claystone		S	Bk to md dk gy																						Well-preserved roots abundant throughout. Underclay.
2.6	Clayey siltstone		G	Md dk to dk gy																						Abundant well-preserved plant roots.

SITE/STATION NO. 64-19 (page 10)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.3	Sand-silt laminite shale		G	Dk to md dk gy and md lt to lt gy																						Very fine to fine grained. Some cross laminations. Plant stems and leaves common in lower 1.5'.
20.9	Sandstone		S	Md lt to vy lt gy																						Very fine to coarse grained. Crossbedded. and cross laminated. Coalified logs and plant stems very common.
1.7	Calcareous sandstone		G	Md to lt ol gy																						Very fine to medium grained. Crossbedded. Very hard, dense. Coalified plant stems present.
25.5	Sandstone		G	Md lt to vy lt gy																						Very fine to coarse grained. Crossbedded and cross laminated. Abundant plant fragments.
4.7	Sandstone		G	Md dk to md lt gy																						Medium to coarse grained. Plant fragments (stems) rare.
0.4	Clay shale		S	Bk to gys bk																						Abundant coalified and carbonized plant stems. Coaly lenses throughout.
0.4	Coal (Lower Mercer)		S	Bk	B			X			X		M-MD	0.5	33.8	50.4	15.3	4.9	71.8	1.0	5.2	1.8	12880	6	-	Bony. Minor white sulfur staining.
2.9	Silty claystone		S	Dk to md gy																						Carbonized roots and stems abundant. Underclay.

SITE/STATION NO. 64-19 (page 11)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.8	Sandy silt shale		G	Md dk to md lt gy																						Carbonized plant stems common. Cross laminations common.
4.1	Sand-silt laminite shale		G	Dk gy to vy lt gy																						Flaser bedding present and poorly developed cross laminations. Siderite nodules common.

SITE/STATION NO. 64-20	COUNTY: Jefferson	COAL SAMPLE NO(S).: 411150/784833/A 411150/784833/B
COMPANY: Brubaker Coal Co.	LAT. °N: 41°11'50" — ELEV. (base lower coal): Appx. 1730'	
MINE: Brubaker Strip No. 3	LONG. °W: 78°48'33" — TWP.: Washington	
PERMIT: 53-3	GEOLOGIST: TMB — 15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Channel	DATE: 6-26-69 — 7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Kittanning		WEATHERING: Fairly fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
?	Coal blossom																									Previously mined.
3.0±	Underclay		S	Md gy																						Soft, semiplastic.
15.0	Clayey siltstone with some sandstone		G	Gn gy																						Rubbly; common rootlets; micaceous.
4.0	Interbedded silt shale and sandstone		G	Mod ol gy																						Slabby; sandier upwards.
10.0	Sandstone		S	Mod gys or.																						Slabby, blocky; thicker bedded to the east; fine grained; micaceous.
7.0	Sand-silt laminite		S	Mod yls gy																						Platy, flaggy, slabby; siderite nodules; lateral accretion crossbedding; micaceous.
9.0	Clay shale grading up to sand-silt laminite		G	Md gy																						Splintery, platy, chippy; plant fragments.
2.45	Coal	1.30	S	Bk	B				X			X	D	1.2	31.5	52.3	15.0	4.8	71.2	1.5	5.4	2.1	12660	7	2570	Blocky fracture; few fusain partings; ½" bone parting 0.5' from top. Whole bench approaches bone coal.
	Coal	1.15		Bk	B			X				X	M-MD	1.1	31.0	51.6	16.3	4.7	69.6	1.5	6.2	1.7	12440	7½	2680	Blocky to splintery fracture; some fusain partings.
0.5+	Siltstone, claystone		S	Gys bk																						Chippy, hackly; carbonaceous.

SITE/STATION NO. 64-21
COMPANY: Minn's Coal Co.
MINE: Minn's Mine
PERMIT: 138-?
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Upper Freeport

COUNTY: Jefferson
LAT. °N: 41°12'52"
LONG. °W: 78°48'18"
GEOLOGIST: TMB
DATE: 6-26-69

ELEV. (base lower coal): Appx. 1720'
TWP.: Washington
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: Falls Creek

COAL SAMPLE NO(S).: 411252/784818
JOINTING: N56W, vert.; N30E, vert.
WEATHERING: Moderately fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0±	Soft clay to clay shale		S	Gys red																						Hackly; poor outcrop.
5.0	Claystone		G	Mod yls gy																						Hackly, rubbly; rootlets; partly covered.
20.0	Clay shale and claystone		S	Mod yls gy																						Chippy, equant, blocky, rubbly; darker and more fissile in middle; rootlets near top.
1.5	Clay shale		G	Dk gy																						Slightly silty; chippy, hackly; micaceous.
19.0	Silt-clay laminite		G	Md dk gy																						Splintery, chippy, flaggy; common plant fossils.
0.1	Clay shale		S	Gys bk																						Chippy.
2.5	Coal		S	BK	B	X	X				X	X	M-MD	1.3	31.6	56.4	10.7	5.1	75.0	1.5	6.7	1.0	13270	9	2790	Thin clay parting 0.2' from top; some knife-edge pyrite partings.
4.0+	Underclay			Md dk gy																						Hackly, rubbly; rootlets.

SITE/STATION NO. 64-22	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410801/785010
COMPANY: Sugar Hill Limestone Co.	LAT. °N: 41°08'01"	ELEV. (base lower coal): Appx. 1590'	
MINE:	LONG. °W: 78°50'10"	TWP.: Winslow	
PERMIT: 496-4	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0+	Clay shale			Dk gy																						Soil developed on top. Platy.
			S																							
1.33	Coal			Bk	B		X				X		M-MB	1.1	33.3	60.5	5.1	5.3	80.6	1.5	6.3	1.2	14380	8½	2350	

SITE/STATION NO. 64-23	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410808/785019/1A 410808/785019/1B
COMPANY:	LAT. °N: 41°08'08"	ELEV. (base lower coal): Appx. 1540'	
MINE:	LONG. °W: 78°50'19"	TWP.: Washington	
PERMIT:	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING: Sandstone: N83W
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Moderately weathered

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal crop																									Lower Freeport.
3.0	Claystone		S	Lt ol gy																						Silty. Top foot is light-gray plastic clay. Limestone nodules common.
11.0	Sandstone		G	Lt gy																						Fine to very fine grained. Siderite band 0.5' thick 0.5' above base.
8.0	Sand-silt laminite		S	Md gy																						
	Clay shale		G	Md gy																						Few very thin sandstone laminae.
3.0	Bone parting	0.2	S	Bk	M																					
	Coal	0.8	S	Bk	B		X				X		M-MB	1.4	33.1	60.9	4.6	5.4	81.4	1.5	6.2	0.9	14470	8½	-	
	Bone parting	0.1	S	Bk	M																					
	Coal	1.9	S	Bk	B			X			X	X	M-MB	1.4	31.3	56.4	10.9	5.0	75.1	1.4	4.9	2.7	13340	8	2730	Tough.

SITE/STATION NO. 64-24 (page 1)
COMPANY:
MINE: Roadcut on I 80
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Middle Kittanning

COUNTY: Jefferson
LAT. °N: 41°08'34"
LONG. °W: 78°52'09"
GEOLOGIST: WAB
DATE: 5-11-71

ELEV. (base lower coal): Appx. 1700'
TWP.: Washington
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: Falls Creek

COAL SAMPLE NO(S).: 410834/785209A, B, and C
JOINTING: None noted
WEATHERING: Very weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUN-DANCE				THICK-NESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.0±	Sandstone		?	Yl gy, vy pale or. to gy or.																						Very fine to medium grained. Seen only as float.
28.0	Covered interval		?																							Green-gray and gray-black to dark-gray clay shale float abundant.
9.0	Clay shale		?	Vy dk gy to dk gy																						Possible seat earth. Float near top.
15.0	Covered interval		?																							Abundant very dark gray to dark-gray platy clay shale float.
1.0	Silty clay shale		S	Md gy to md lt gy																						Platy fracture.
	Coal	1.1	S	Bk	B			X			X		D MD	1.4	31.3	49.1	18.2	4.7	67.1	1.3	8.0	0.7	12030	8½	2730	Upper split, Middle Kittanning coal.
2.8	Claystone	0.8	S	Vy dk gy to md dk gy																						Seat earth, rooted.
	Coal	0.9	S	Bk	B			X			X	X	M MD	0.9	25.9	33.7	39.5	3.5	45.7	0.9	6.4	4.0	8230	3½	2670	Middle Kittanning (lower split).
2.0	Claystone			Vy dk gy to md dk gy																						Underclay, rooted.

SITE/STATION NO. 64-24 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0	Covered interval		?																							Very dark to dark gray. Platy clay shale float abundant.
1.0	Interlaminated sand siltstone		?	Bk to vy dk gy, ol gy																						Coaly lenses near base. Hard, resistant. Irregular bedding.
0.2	Coal		S	Bk	B		X				X		MB M	1.3	35.7	47.9	15.1	5.0	70.2	1.4	7.7	0.6	12550	9	2430	Lower Kittanning No. 4 coal?
3.0±	Claystone		S	Lt gy to md lt gy, bn gy																						
3.0±	Siltstone and silt shale		?	Gn gy, lt gn gy																						Silt content increases downward.
2.0	Cover		?																							

SITE/STATION NO. 64-25	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411154/784834/2A
COMPANY: Brubaker Bros. Coal Co.	LAT. °N: 41°11'54"	ELEV. (base lower coal): Appx. 1700'	411154/784834/2B
MINE:	LONG. °W: 78°48'34"	TWP.: Washington	
PERMIT: 53-3	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING: Sandstone: N32W, N57W
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Claroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Cover																									
0.6	Coal crop																									Weathered. Lower Freeport coal.
7.0	Claystone		S	Md dk gy																						Silty. Upper 3' is light gray with slickensides.
10.5	Sandstone		G	Lt gy																						Becomes siltstone near top. Massive.
1.2	Claystone		S	Lt ol gy																						Rootworked. Few carbonaceous streaks.
12.0	Sandstone		S	Md lt gy																						Fine to very fine grained. Upper 4' light olive gray.
8.0	Clay shale		S	Md to md dk gy																						Color banding. Siderite nodules common. Profuse plant leaves and fragments.
0.2	Canneloid shale		S	Bk																						Blocky, tough.
2.4	Coal	0.6	S	Bk	B				X				D-MD	1.1	31.8	54.9	12.2	4.8	73.7	1.4	5.1	2.8	13170	7½	2190	Blocky.
	Coal	1.8	S	Bk	B		X				X		M-MB	0.8	30.7	51.7	16.8	4.5	69.3	1.3	4.6	3.5	12430	6½	2180	
0.35+	Claystone		S	Md dk gy																						Rootworked.

SITE/STATION NO. 64-26	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411214/784835
COMPANY: Minns Coal Co.	LAT. °N: 41°12'14"	ELEV. (base lower coal): Appx. 1680'	
MINE:	LONG. °W: 78°48'35"	TWP.: Washington	
PERMIT: 138-9	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Lower Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA															COAL ANALYSIS												
					COAL										PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
4.0	Claystone		S	Tan and gy																						Plastic clay. Few limestone nodules.	
10.0	Silt shale		S	Lt ol gy																						Soft.	
6.0-10.0	Sandstone		U	Vy lt bls gy																						Medium to fine grained. Some crossbedding. Lower part more massive. Locally cuts into unit below.	
0.5-1.25	Clay shale		S	Bk to md gy, and lt ol gy																						Black at base, becoming lighter in color upward. Subfissile.	
2.2	Coal			Bk	B		X				X	X	D-MD	1.0	34.4	56.5	8.1	5.1	76.7	1.5	5.3	3.3	13800	8	2140		

SITE/STATION NO. 64-27	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411219/784834
COMPANY: Minns Coal Co.	LAT. °N: 41°12'19"	ELEV. (base lower coal): Appx. 1660'	
MINE:	LONG. °W: 78°48'34"	TWP.: Washington	
PERMIT: 138-9	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING: Sandstone: N37E, N46E, N14W
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal crop																									Lower Freeport coal.
4.5	Claystone		S	Md gy																						Nonbedded. Stigmaria.
8.0	Sandstone		G	Lt gy																						Very fine to fine grained. Massive.
	Siltstone		G	Lt ol gy																						
4.0-7.0	Clay shale		S	Lt ol gy																						Lower 3' laterally gradational with unit below.
3.0-6.0	Sandstone		G	Lt gy																						Micro crossbedding. Fine to medium grained.
5.5	Claystone		S	Lt ol gy																						
3.0	Clay shale		G	Md dk gy																						Becomes medium gray upward. Plant leaves common.
2.1	Coal		S	Bk	B		X				X		M-MB	1.1	32.4	57.2	9.3	5.1	76.3	1.5	5.2	2.6	13620	8½	2240	Blocky fracture.

SITE/STATION NO.: 64-28 (page 1)	COUNTY: Jefferson			COAL SAMPLE NO(S).: 411228/784516	
COMPANY: Brockway Clay Co.	LAT. °N: 41°12'26"	ELEV. (base lower coal): Appx. 1720'			
MINE:	LONG. °W: 78°45'16"	TWP.: Snyder			
PERMIT: Not known	GEOLOGIST: WAB	15' QUADRANGLE: DuBois		JOINTING: Coal: N42W, N72W; clay shale: N42W, N52E; sandstone: N88E, N25W	
SAMPLING METHOD: Channel	DATE: 10-8-70	7 1/2' QUADRANGLE: Falls Creek			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Weathered	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0+	Sandstone		G	Tan																						Fine to very fine grained. Plant fossils. Lateral accretion bedding.
6.0	Sandstone		G	Tan																						Medium to fine grained. Plant fossils. Crossbedded.
7.1	Clay shale		S	Dk gy to md lt gy																						Plant fossils. Becomes silty near top.
4.8	Claystone		G	Md lt gy to md dk gy																						Seat earth; rooted near top.
5.6	Interlaminated silt-clay shale		G	Md gy, gn gy, lt gn gy																						Iron-bearing zones in lower 1.0'.
1.5	Interlaminated sand siltstone		G	Yl tan																						Weathered zone in highwall. Friable. Sandy.
3.7	Interlaminated sand siltstone		G	Dk gy to md dk gy																						Internally slumped. Fracture irregular.
24.0	Clay shale			Bk to vy dk gy																						Few invertebrate fossils. Siderite nodules common. Platy fracture.

SITE/STATION NO. 64-28 (page 2)
COMPANY:
MINE:
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES:
COUNTY:
LAT. °N:
LONG. °W:
GEOLOGIST:
DATE:
ELEV. (base lower coal):
TWP.:
15' QUADRANGLE:
7 1/2' QUADRANGLE:
COAL SAMPLE NO(S).:
JOINTING:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.7	Coal		S	Bk	B	X					X	X	M B	0.9	34.3	57.1	7.6	5.2	78.7	1.5	6.0	1.0	14020	8½	2870	Clay shale band present, 0.1' thick 0.7' from base.
14.2	Claystone		S	Lt gy to vy lt gy																						Underclay (being mined). Rooted. Soft, plastic, internally slumped.

SITE/STATION NO. 64-29	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411238/784614A, 411238/784614B, 411237/784609
COMPANY: Brockway Clay Co.	LAT. °N: 41°12'37"	ELEV. (base lower coal): Appx. 1560'	
MINE:	LONG. °W: 78°46'09"	TWP.: Washington	
PERMIT: Not known	GEOLOGIST: WAB	15' QUADRANGLE: DuBois	JOINTING: Claystone: N38W, N75W, N52E, N20E; clay shale: N45E, N54W, N36W
SAMPLING METHOD: Channel	DATE: 7-8-71	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod. dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30.0+	Clay shale		S	Vy dk gy to md gy																						Few invertebrate fossils. Subplanar bedding. Platy fracture.
4.8	Coal	2.9	S	Bk	B		X			X	X		MB -M	1.9	31.6	60.6	5.9	5.3	78.4	1.5	8.1	0.8	13900	9	Above 2910	Sample 411237/784609 taken where underlying coal is absent.
														1.7	31.4	57.7	9.2	5.2	76.3	1.5	6.9	0.9	13490	8½	2830	Sample 411238/784614A taken where underlying coal is present.
	Claystone	1.2	S	Lt gy to dk gy																						Few plant fossils. Underclay. Color darkens upward.
	Coal	0.7	S	Bk	B				X		X		M-MD	1.2	29.6	44.1	25.1	4.3	59.1	1.1	9.6	0.8	10790	7½	2680	Pinches out completely in eastern portion of mine. Sample 411238/784614B.
12.0+	Claystone			Vy lt gy to md dk gy																						Underclay (being mined). Rooted. Soft, plastic. Internally slumped.

SITE/STATION NO. 64-30	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411252/784622A 411252/784622B
COMPANY:	LAT. °N: 41°12'52"	ELEV. (base lower coal): Appx. 1500'	
MINE: Road cut	LONG. °W: 78°46'22"	TWP.: Washington	
PERMIT:	GEOLOGIST: WAB	15' QUADRANGLE: DuBois	JOINTING: None noted
SAMPLING METHOD: Channel	DATE: 10-7-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0	Coal			Bk	B		X				X		M-MB	4.2	28.4	53.5	13.9	4.5	67.3	1.3	12.4	0.6	11620	NC	2670	Upper split -- Lower Kittanning coal.
1.5	Claystone		S	Tan to yl																						Seat earth. Rooted.
1.0	Coal		S	Bk				X			X		MB-M	13.2	25.9	49.2	11.7	5.1	60.6	1.0	20.9	0.7	10290	NC	2570	Lower split -- Lower Kittanning coal.
1.5+	Claystone		S	Tan to yl																						Underclay. Rooted. Lower contact not exposed.

SITE/STATION NO. 64-31	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411355/784639
COMPANY: Ross Ferrara	LAT. °N: 41°13'55"	ELEV. (base lower coal): Appx. 1540'	
MINE:	LONG. °W: 78°46'39"	TWP.: Snyder	
PERMIT:	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA															COAL ANALYSIS													
					COAL										PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																						
						ABUNDANCE				THICKNESS																		
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS		
12.0+	Clay shale		S	Lt ol gy																						Soil developed on top.		
5.0	Sandstone		S	Lt ol gy																						Medium grained. Massive.		
5.5	Clay shale		S	Md to md lt gy																						½" - 1" beds.		
0.6	Bone		S	Bk	M																					Tough.		
1.6	Coal			Bk	B		X				X	X	M-MD	1.2	32.3	60.4	6.1	5.2	78.8	1.5	7.6	0.8	13970	6½	2680			

SITE/STATION NO. 64-32	COUNTY: Jefferson		COAL SAMPLE NO(S).: 411402/784614
COMPANY:	LAT. °N: 41°14'02"	ELEV. (base lower coal): Appx. 1620'	
MINE:	LONG. °W: 78°46'14"	TWP.: Snyder	
PERMIT:	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING: Silt shale: N68W, N66E, N87E
SAMPLING METHOD: Channel	DATE: 8-70	7 1/2' QUADRANGLE: Falls Creek	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Moderate

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0±	Clay shale		G	Lt ol gy																						Inaccessible. Weathers chippy.
6.0	Silt shale		S	Md gy																						Few plant fragments. Lower part is subfissile (beds to 1" thick); upper part fissile.
4.3	Clay shale		G	Md to md dk gy																						Few siderite bands. Few plant fragments.
0.2	Shale		S	Bk																						Fissile.
2.2	Coal			Bk	B		X			X	X		M-MB	1.5	31.2	56.9	10.4	5.0	74.6	1.4	7.6	1.0	13200	8½	2730	Few thin fusain partings. Has been augered.

SITE/STATION NO. 64-33 (page 1)
COMPANY: Sugar Hill Limestone Co.
MINE: Sugar Hill
PERMIT:
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Jefferson
LAT. °N: 41°14'59"
LONG. °W: 78°52'10"
GEOLOGIST: WEE, WAB
DATE: 9-24-70

ELEV. (base lower coal): Appx. 1800'
TWP.: Snyder
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: Falls Creek

COAL SAMPLE NO(S).: 411459/785210/8
JOINTING: Limestone - N1E, N51E, N88E
Fault - strike N71E, dip 22.5SE, disp. 1'±
WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18+	Sandstone		G	Md lt gy																						Very fine - fine grained. Plant fossils.
9.5	Clayey, sandy silt shale		G	Dk gy																						Plant fossils in upper half.
2.0	Clay shale		S	Gy bk																						Few siderite bands.
0.8	Coal		S	Bk	B			x				x	M	2.2	33.6	55.0	9.2	5.1	75.0	1.5	8.3	0.9	13390	8	Above 2910	
7.0	Underclay		G	Md lt gy																						
12.0	Silt shale to silty clay shale		G	Gn gy																						Few sandstone beds to 0.3'. Ferruginous orange and black stain.
4.5	Underclay		S	Lt gy																						
1.0	Clayey, silty sandstone		G	Md lt gy																						Silt to medium grained. Friable.
4.0	Silty clay shale		G	Md lt gy																						Lumpy bedding.
6.0	Sandy silt shale		G	Md lt gy																						
21.5	Calcareous clay shale		S	Dk gy to dk gn gy																						Siderite nodules and lenses to 0.5'. Marine fossils.
0.0-0.3	Calcareous siderite(?)		S	Md gy																						Marine fossils. Weathers gray red. "Buhrstone Iron-ore."

SITE/STATION NO. 64-33 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Banded (B), Non-Bonded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
6.2-6.5	Limestone		S	Md gy																						Marine fossils. Micritic. Dense. Vanport.
0.2	Carbonaceous silt shale		S	Gy bk																						Vitrain lenses. Marine fossils.
0.3+	Silt shale			Dk gy																						Plant fossils.

SITE/STATION NO. 64-34	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410534/785835A, 410534/785835B
COMPANY: Avoine Coal & Coke Co.	LAT. °N: 41°05'34"	ELEV. (base lower coal): Appx. 1360'	
MINE: Deep Mine (Fuller Mine)	LONG. °W: 78°58'35"	TWP.: Pinecreek	
PERMIT: -	GEOLOGIST: WAB	15' QUADRANGLE: DuBois	JOINTING: Coal - N60W, N38E
SAMPLING METHOD: Channel	DATE: 6-29-71	7 1/2' QUADRANGLE: Reynoldsville	
REPORTED COAL NAMES: Brookville			WEATHERING: Very weathered

STRATIGRAPHIC DATA															COAL ANALYSIS											
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Silty clay shale		S	Vy dk gy to md dk gy																						Observed only as float.
4.9	Coal	1.0	S	Bk	B				x			x	M-MD	1.2	35.2	58.2	5.4	5.4	79.7	1.4	6.8	1.3	14290	8½	Above 2910	Hard, tough, sulfur stained.
	Carbonaceous claystone	0.3	S	Bk to vy dk gy																						Hard, tough, highly jointed, homogeneous.
	Coal	3.6		Bk	B			x			x		M-MD	1.1	33.5	54.8	10.0	5.1	75.2	1.3	6.2	1.6	13420	8½	Above 2910	Sulfur stained. Few pyrite lenses.

SITE/STATION NO. 64-35
COUNTY: Jefferson
COAL SAMPLE NO(S).: 410636/785905
COMPANY: Robert Emery Coal Co.
LAT. °N: 41°06'36"
ELEV. (base lower coal): Appx. 1540'
MINE:
LONG. °W: 78°59'05"
TWP.: Pinecreek
PERMIT: 475-5
GEOLOGIST: WAB
15' QUADRANGLE: DuBois
JOINTING: Coal - N60W, N25E
SAMPLING METHOD: Channel
DATE: 9-15-71
7 1/2' QUADRANGLE: Reynoldsville
REPORTED COAL NAMES: Middle Kittanning
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Sandy silt shale; silty fissile sandstone			Md gy to lt gy																						Silt to fine grained. Longitudinal crossbeds. Broken plant fossils common.
1.8	Coal		S	Bk	B		x			x	x		B-MB	1.9	33.8	62.3	2.0	5.5	83.1	1.5	7.2	0.7	14640	8½	2620	
	Claystone		S	Dk gy to md dk gy																						Mine floor. Underclay, rooted.

SITE/STATION NO. 64-36
COMPANY: Sugar Hill Limestone Co.
MINE:
PERMIT: 496
SAMPLING METHOD: Face channel
REPORTED COAL NAMES: Upper Freeport (E)

COUNTY: Jefferson
LAT. °N: 41°04'36"
LONG. °W: 78°52'31"
GEOLOGIST: MAS-JDI
DATE: 4-25-74

ELEV. (base lower coal): Appx. 1600'
TWP.: Winslow
15' QUADRANGLE: DuBois
7 1/2' QUADRANGLE: Reynoldsville

COAL SAMPLE NO(S).: 410436/785231/2
JOINTING: Coal: N75W (face)
WEATHERING: Moderately weathered

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Bonded (N), or Mixed (M)	COAL: VITRAIN ABUNDANCE > 60 %	30-60 %	15-30 %	< 15 %	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%): MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%): HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0	Sandstone		U																							
3.0	Clay shale		S																							
12.0-20.0	Sand-silt laminite		G																							Laterally replaces underlying sandstone.
	Sandstone		U	Yl gy																						Medium grained. Shale-pebble conglomerate at base.
0-4.0	Silty clay shale		S	Gy bk to dk gy																						
12.0	Sand-silt laminite		G	Dk gy to lt gy																						Thickens at expense of underlying sandstone to north.
	Sandstone		U	Yl gy																						Plane bedding and small-scale festoon crossbedding; medium grained. Shale-pebble conglomerate at base.
0-5.0	Silt shale		S	Dk gy																						Penecontemporaneous slump at north end of highwall. Plant fragments common.
2.3	Coal		S	Bk	B	X				X	X		B	1.8	34.3	58.2	5.7	5.2	79.0	1.5	6.8	1.8	14230	8½	2080	Thin, bony partings in upper 0.7'.
	Claystone (underclay)																									

SITE/STATION NO.	64-37	COUNTY:	Jefferson	COAL SAMPLE NO(S).:	410337/785905 A, B, and C 410336/785908
COMPANY:	Strishock Coal Co.	LAT. °N: 41°03'35"	ELEV. (base lower coal): Appx. 1680'		
MINE:		LONG. °W: 78°59'09"	TWP.: McCalmont		
PERMIT:	214-6	GEOLOGIST: WAB	15' QUADRANGLE: DuBois	JOINTING:	Coal: N68W, N27E, N32E
SAMPLING METHOD:	Channel	DATE: 9-9-71	7 1/2' QUADRANGLE: Reynoldsville		
REPORTED COAL NAMES:	Middle Kittanning			WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0	Silt shale			Md to md dk gy																						Siderite nodules common. Planar bedding.
1.6	Coal and coaly shale		S	Bk	B				X		X	X	M-MD	4.0	29.3	45.8	20.9	4.7	62.2	1.0	9.4	1.8	11060	7	2550	Sample 410336/785908 taken in paleotopographic low.
														8.7	26.4	39.9	25.0	4.3	51.2	0.9	17.7	0.9	8660	NC	2780	Sample 410337/785905C taken on paleotopographic high.
12.0	Silty claystone to silty clay shale		S	Md dk to lt gy, gn gy, yl gy																						Plant fragments common. Thickness varies -- decreases westward to 3.1'.
0.2	Carbonaceous clay shale		G	Bk to dk gy																						Plant fossils. Color lightens upward.
1.8	Coal	1.0	S	Bk	B	X				X	X		M	3.1	32.6	60.7	3.6	5.1	78.9	1.4	10.3	0.7	13850	3	2580	Sample 410337/785905B.
	Coal	0.8	S	Bk	B	X				X			MB	11.2	27.0	59.3	2.5	5.0	72.1	1.2	18.6	0.6	12310	NC	2310	Few nonpersistent shaly layers. Sample 410337/785905A.
-	Claystone		S	Md dk to md gy																						Mine floor. Underclay.

SITE/STATION NO. 64-38	COUNTY: Jefferson		COAL SAMPLE NO(S).: 410341/785850A, 410341/785850B
COMPANY: Strishock Coal Co.	LAT. °N: 41°03'37"	ELEV. (base lower coal): Appx. 1620'	
MINE:	LONG. °W: 78°58'44"	TWP.: McCalmont	
PERMIT: 214-6	GEOLOGIST: WAB	15' QUADRANGLE: DuBois	JOINTING: Coal: N56W; claystone: N58E; clay shale: N54E, N40W
SAMPLING METHOD: Channel	DATE: 6-10-71	7 1/2' QUADRANGLE: Reynoldsville	
REPORTED COAL NAMES: Lower Kittanning			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clorain-Durain Luster (bright, mod-bright, mid-lustraus, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
18.0+	Clay shale			Vy dk to md dk gy																						Few marine invertebrate fossils. Siderite nodules common. Subplanar bedding.
0.7	Coal		S	Bk	B			X			X	X	M-MD	3.1	27.5	53.2	16.2	4.6	66.9	1.2	9.1	2.0	11570	NC	Above 2910	Position varies in highwall at expense of underlying units.
0.3	Carbonaceous silty clay shale		S	Vy dk to md dk gy																						Plant fossils.
0.5	Claystone		S	Md to dk gy																						Seat earth, rooted. Silty in places.
1.4	Silt-clay laminite		G	Md dk to dk gy, md lt to lt gy																						Plant fragments. Subplanar bedding.
1.8	Silty claystone		G	Md dk to md gy																						Subfissile. Plant fragments.
1.8	Coal		S	Bk	B		X			X	X		B-MB	2.0	30.2	60.8	7.0	5.1	77.4	1.4	7.6	1.5	13640	NC	Above 2910	Few thin nonpersistent shaly layers.
-	Claystone		S	Md to dk gy																						Mine floor. Underclay, rooted.

SITE/STATION NO. 64-39 (page 1)	COUNTY: Jefferson	COAL SAMPLE NO(S).: 410424/785300 A through G
COMPANY: Gearhart Coal Co.	LAT. °N: 41°04'24" ELEV. (base lower coal): Appx. 1500'	
MINE:	LONG. °W: 78°53'00" TWP.: Winslow	
PERMIT: 632-1	GEOLOGIST: WAB 15' QUADRANGLE: DuBois	JOINTING: Coal: N70W, N28E, N21W
SAMPLING METHOD: Channel	DATE: 6-21-71 7 1/2' QUADRANGLE: Reynoldsville	
REPORTED COAL NAMES: Lower Freeport		WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0+	Clayey silt shale			Md dk to md gy, gn gy																						More greenish upward. Planar beds.
0.3	Carbonaceous clay shale		S	Bk to vy dk gy																						Few plant fragments. Few coaly lenses.
0.7	Claystone		G	Dk to md dk gy, ol gy																						Seat earth. Color mottled.
0.6	Coal		S	Bk to vy dk gy	B				X		X		D M MD	4.1	25.9	49.5	20.5	4.3	60.9	1.2	12.2	0.9	10540	NC	Above 2910	Vitrain content increases downward.
0.4	Clay shale		S	Vy dk to dk gy, ol gy																						Approaches claystone in places. Minor color mottling.
	Coal	1.2	S	Bk	B			X			X	X	MD M MB	2.8	27.4	49.7	20.1	4.4	63.4	1.3	9.9	0.9	11200	1½	Above 2910	Few nonpersistent shaly layers.
	Carbonaceous clay shale	0.3	S	Bk to vy dk gy																						Plant fossils. Sulfur stained. Planar bedded.
	Coal	1.7	S	Bk	B			X			X	X	MD M MB	2.2	28.6	58.4	10.8	4.8	73.2	1.4	9.1	0.7	12860	3	Above 2910	Few thin, shaly, nonpersistent layers.
9.7	Carbonaceous clay shale	.15	S	Bk to vy dk gy																						Sulfur stained.

SITE/STATION NO. 64-39 (page 2)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
	Coal	0.7	S	Bk	B			X		X	X		M MD	2.1	26.6	57.1	14.2	4.6	70.5	1.3	8.7	0.7	12330	2	Above 2910	
	Carbonaceous clay shale	.15	S	Bk to vy dk gy																						Sulfur stained.
	Coal	0.7	S	Bk	B				X		X		M	1.8	29.0	59.2	10.0	4.8	75.0	1.5	8.0	0.7	13190	4½	Above 2910	
	Coal	1.6	S	Bk	B				X			X	D	1.5	30.2	64.4	3.9	5.2	81.9	1.7	6.6	0.7	14370	8	Above 2910	Almost entirely fusain and durain in upper 0.6'. Nonbanded.
	Coal	3.2	S	Bk	B		X			X	X	X	MB B	1.7	31.5	61.2	5.6	5.2	79.2	1.6	7.7	0.7	14030	9	Above 2910	Few thin, shaly, nonpersistent layers.

SITE/STATION NO. 64-41 (page 1)	COUNTY: Jefferson		COAL SAMPLE NO(S).:
COMPANY: Pa. Geologic Survey	LAT. °N: 41°12'57"	ELEV. (base lower coal): Appx. 1552'	
MINE: DuBois Drill Hole #6	LONG. °W: 78°55'16"	TWP.: Warsaw	
PERMIT:	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Core Samples	DATE: 4-18-73	7 1/2' QUADRANGLE: Hazen	
REPORTED COAL NAMES: Mercer, Lower Kittanning, Middle Kittanning			WEATHERING: Fresh (Core)

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19.0	Surface (Top of drill hole)																									Unconsolidated material.
46.1	Sandstone		S	Ol gy, md dk to md lt gy																						Upper 27' calcareous; cross laminated; medium grained.
0.1	Coaly shale		S	Bk																						Thin coaly laminae.
7.6	Sandstone		U	Ol gy, mod bn																						Fine to coarse grained; rare coaly laminae.
3.7	Silt shale		S	Dk to md dk gy																						Abundant carbonized plant material.
4.7	Sand-silt laminite		G	Dk to md dk gy, md lt to lt gy																						Abundant carbonized plant material; silt predominates.
2.3	Interbedded sand and silt		S	Dk to md dk gy, md to lt gy																						Carbonized plant fragments common. Sand lighter color.
1.0	Sandstone		S	Md lt to lt gy																						Few silty laminae; cross laminated.
16.7	Clay shale		S	Bk, dk to md dk gy																						Rare carbonized plant fragments.
1.3	Shaly coal (Middle Kittanning)			Bk	B				X			X	B-MB	2.4	30.4	46.7	20.5	4.5	64.1	1.3	6.3	3.3	11380	5	2250	Shaly partings common; claystone parting 0.15' thick not included in coal sample.

SITE/STATION NO. 64-41 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.7	Claystone		S	Gy bk to md gy																						Soft, plastic; few carbonized rootlets; slickensides common in upper part.
30.05	Clay shale		G	Dk to md dk gy																						Carbonized plant stems in upper part common; siderite nodules and marine fossils common in lower part.
0.05	Coal (Lower Kittanning rider)		S	Bk	B			X				X	M-D													
2.1	Claystone		S	Md dk to md gy																						Abundant silt laminae; abundant rootlets.
3.6	Silty sandstone		S	Md to lt gy																						Abundant carbonized plant material.
0.7	Sand-silt laminite		S	Dk to md dk gy, md to md lt gy																						Minor cross laminations; few carbonized plant materials.
0.9	Sandy silt shale		S	Dk to md dk gy, md to md lt gy																						Carbonized plant material (few); convolute bedding.
3.5	Sand-silt laminite		G	Md dk to md lt gy																						Minor cross lamination; carbonized plant material common.
0.8	Silt shale		G	Dk to md gy																						Rare carbonized plant material.

SITE/STATION NO. 64-41 (page 3)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.3	Sand-silt laminite		G	Dk to md dk gy, md to md lt gy																						Sand lighter color; carbonized plant material common.
6.1	Silt shale		G	Dk to md dk gy																						Carbonized plant material in upper part (few); siderite bands in lower part.
6.9	Clay shale		G	Bk to md dk gy																						Carbonized plant fragments common; abundant coaly laminae near base.
1.0	Silty claystone		S	Dk gy																						Rootlets and carbonized plant fragments abundant.
0.3	Carbonaceous clay shale		S	Bk to dk gy																						Coaly laminae and carbonized plant fragments abundant.
4.0	Silty clay shale		G	Dk to md dk gy																						Few sandy laminae; carbonized plant fragments abundant.
2.6	Clayey siltstone		G	Dk to md dk gy																						Carbonized plant fragments abundant.
0.7	Sand-silt laminite		S	Dk to md dk gy, md to lt gy																						Wavy bedding; carbonized plant fragments common.
0.4	Carbonized clay shale		S	Bk to dk gy																						Coaly partings and carbonized plant fragments abundant.

SITE/STATION NO. 64-41 (page 4)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.6	Coal (Lower Kittanning No. 3)		G	Bk	B				X		X	X	D-MD	2.1	31.5	47.2	19.2	4.9	66.4	1.1	7.1	1.3	11640	7	-	Clay partings common. Few pyritized plant fragments.
0.6	Carbonaceous claystone		S	Bk to dk gy																						Slickensides and carbonized plant fragments common.
0.3	Coal (Lower Kittanning No. 3)		G	Bk	B				X			X	B	1.8	31.0	44.8	22.4	4.5	62.3	1.0	7.9	1.9	11140	7½	-	Few pyrite partings.
1.45	Claystone		S	Dk to md dk gy, bn gy																						Carbonized plant fragments and rootlets abundant.
1.05	Coal (Lower Kittanning No. 3)		S	Bk	B				X		X	X	B-MB	1.1	28.4	34.8	35.7	3.6	47.4	0.8	3.6	8.9	8670	4	2470	Pyrite lenses and partings common.
4.0	Claystone		S	Dk to md dk gy, bn gy																						Carbonized plant fragments and rootlets rare.
0.7	Clayey silt shale		G	Dk to md dk gy																						Carbonized plant fragments rare.
2.2	Silty sandstone		S	Dk to lt gy																						Very fine to fine grained. Silt laminae common.
1.9	Sandy siltstone		G	Dk to md dk gy																						Wavy bedding.
0.4	Clay shale		S	Dk to md dk gy																						Few silty laminae.

SITE/STATION NO. 64-41 (page 5)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: / ELEV. (base lower coal):	
MINE:	LONG. °W: / TWP.:	
PERMIT:	GEOLOGIST: / 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: / 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.2	Sandstone		S	Md lt to lt gy																						Carbonized plant fragments rare.
0.4	Siltstone/silt shale		G	Dk to md dk gy																						Homogeneous; 2" siderite nodule at base.
2.6	Clay shale		S	Gy bk to md dk gy																						Siderite bands and nodules common; darker near base.
0.9	Carbonaceous clay shale		G	Bk to gy bk																						Plant stem impressions and siderite nodules rare.
2.0	Coal (Lower Kittanning No. 1)		S	Bk	B		X	X		X	X	X	MB-B	1.3	34.6	36.2	27.9	3.6	56.3	0.9	6.1	5.2	10090	7	2040	Pyrite partings common up to 0.1' thick.
	NOTE: THIS 68.6 FOOT INTERVAL NOT INCLUDED.																									
25.8	Sandstone			Md lt to lt gy																						Siderite pebbles and silt shale pebbles common. Coal partings common.
5.6	Silt shale		S	Dk to md dk gy																						Carbonized plant stems rare, siderite nodules common.
0.6	Interbedded sandstone and siltstone		S	Dk to md dk gy, md lt to lt gy																						Sandstone lighter in color, fine grained.
2.5	Sandstone		S	Md lt to lt gy																						Few silty streaks and lenses.

SITE/STATION NO. 64-41 (page 6)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN ABUNDANCE				VITRAIN THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), ar Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Cloroin-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.3	Siltstone		S	Dk to md dk gy, lt gy																						Sandstone lenses.
29.3	Sandstone		S	Md lt to lt gy																						Fine to coarse grained, massive beds in lower 20'.
0.2	Coal		S	Bk	B				X			X	MD													Tough, bony.
0.3	Sandstone		S	Lt gy																						Sandstone cuts into underlying shale.
8.4	Clay shale		U	Gy bk to dk gy																						Very silty. Abundant siderite nodules and bands.
0.7	Coal (Mercer)		S	Bk	B			X			X	X	MD -D	1.4	26.3	30.8	41.5	3.4	45.7	0.7	4.6	4.1	8120	1	2380	Tough, bony.
0.9	Claystone		S	Dk gy, bns gy																						Abundant rootlets and slickensides.
0.35	Coal (Mercer)		G	Bk	B			X			X	X	D-MD	1.0	24.0	28.4	46.6	3.3	41.5	0.6	4.1	3.9	7400	1	2620	Tough, bony.
0.45	Silt shale		S	Bn bk																						Abundant bark impressions; few thin coal partings.
1.75	Coal (Mercer)		S	Bk	B			X			X	X	M-MD	1.3	29.9	38.1	30.7	4.0	54.7	0.8	3.6	6.2	9920	4	2260	Tough, bony. Pyrite parting 0.1' thick.
2.85	Silty claystone		S	Md dk gy																						Hard, plastic; abundant rootlets.
5.4	Sandy silt shale		G	Dk to md gy																						Carbonized plant fragments (few to rare).

SITE/STATION NO. 64-41 (page 7)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.6	Silty sandstone		S	Md dk to md lt gy																						Hard; carbonized plant fragments common.
1.0	Sandy silt shale		S	Dk to md gy																						Carbonaceous plant fragments common.
2.0	Clay shale		S	Md dk gy, ol gy																						Abundant plant fragments; few coal partings.
0.5	Clayey silt shale		G	Dk to md dk gy																						Carbonaceous and coalified plant fragments common.
0.6	Claystone		S	Gy bk to md dk gy																						Few coal lenses and partings; abundant slickensides.
2.9	Silty claystone		S	Md dk to md gy, ol gy																						Plastic; rootlets and plant fragments common.
1.3	Coal (Mercer)		S	Bk	B		X	X			X	X	B-D	1.9	28.7	44.4	25.0	4.1	60.2	0.9	7.4	2.4	10740	6	-	Rare pyrite lenses; carbonaceous clay shale parting 0.1' thick 0.3' above base.
0.3	Carbonaceous clay shale		S	Bk to gy bk																						Very thin coal partings near top and bottom.
0.9	Coal (Mercer)		S	Bk	B		X			X	X		M	1.7	25.6	38.5	34.2	3.8	51.2	0.8	6.2	3.8	9180	5½	2620	Few clay shale partings and pyrite streaks.
0.3	Coaly shale		G	Bk	B				X			X	D	1.7	20.4	24.3	53.6	2.9	34.6	0.6	7.4	0.9	6130	1	2910+	Clay shale, coal partings.

SITE/STATION NO. 64-42 (page 1)	COUNTY: Jefferson		COAL SAMPLE NO(S).:
COMPANY: Pa. Geologic Survey	LAT. °N: 41°07'40"	ELEV. (base lower coal): Appx. 1395'	
MINE: DuBois Drill Hole #7	LONG. °W: 78°57'34"	TWP.: Pinecreek	
PERMIT:	GEOLOGIST: ADG	15' QUADRANGLE: DuBois	JOINTING:
SAMPLING METHOD: Core samples	DATE: 5-24-73	7 1/2' QUADRANGLE: Hazen	
REPORTED COAL NAMES: Mercer, Clarion, Middle and Upper Kittanning, Lower Freeport			WEATHERING: Fresh (Core)

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
19.1	Surface (Top of drill hole)																									Unconsolidated material.
13.2	Sand-silt laminite		S	Gy bk, md gy																						Sand lighter in color; bedding generally inclined, plant stems common.
2.0	Sandstone		S	Md gy																						Very fine to fine grained, carbonaceous material common.
0.7	Sandy claystone		G	Lt bns gy																						Some is plastic.
0.6	Sand-silt laminite		S	Gy bk, md gy																						Sand lighter in color; abundant carbonaceous material and mica.
1.7	Shaly coal		S	Bk	B			X				X	MD	3.4	23.7	34.6	38.3	3.7	47.4	0.8	7.5	2.3	8420	1½	2570	Abundant shale partings; pyrite blebs common.
7.75	Sandstone		S	Md gy																						Few coal spars; medium to coarse grained; mostly massive bedding.
0.55	Coal (Lower Freeport)		S	Bk	B		X				X	X	M-MD	2.3	38.4	49.6	9.7	5.3	73.6	1.3	4.6	5.5	13180	7½	2300	Few pyrite blebs.
0.3	Coal (Lower Freeport)		S	Bk	B			X			X	X	M	1.7	38.5	50.8	9.0	5.3	75.1	1.3	6.6	2.7	13510	6	2280	Tough, bony.
1.2	Coal (Lower Freeport)		S	Bk	B	X	X			X	X		MB	2.5	35.4	53.0	9.1	5.1	74.0	1.4	6.5	3.9	13260	7½	2270	Few pyrite blebs.
0.6	Coal (Lower Freeport)		S	Bk	B			X			X	X	D	2.7	31.2	46.4	19.7	4.6	63.9	1.2	7.4	3.2	11490	6½	2730	
11.7	Claystone			Ol gy																						Slickensides common.

SITE/STATION NO. 64-42 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2mm														
16.1	Clay shale		G	Md dk gy, lt gns gy																						Rare limestone nodules, few slickensides.
0.5	Coal (Upper Kittanning)		S	Bk	B		X				X	X	M-MB	1.9	26.6	40.1	31.4	3.7	53.4	1.0	5.0	5.5	9570	3½	2000	Pyrite lenses common.
	NOTE: THIS 32.1 FOOT INTERVAL NOT INCLUDED.																									
6.3	Sand-silt laminite			Dk to md dk gy, md to lt gy																						Few plant fragments, sand lighter color.
12.3	Clay shale		G	Gy bk to md dk gy																						Few siderite bands, few plant fragments, invertebrate fossils.
2.3	Siltstone		G	Gy bk to md dk gy, md to md lt gy																						Sand laminae in upper part. Few siderite bands.
2.6	Silt shale/siltstone		G	Gy bk to md dk gy																						Invertebrate fossils common.
2.2	Sandy siltstone		G	Dk to md dk gy, md to md lt gy																						Silt predominates, sand lighter in color.

SITE/STATION NO. 64-42 (page 3)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.5	Silty clay shale		G	Gy bk to dk gy, bn bk																						Few siderite nodules and bands; invertebrate fossils common.
1.2	Sandstone		G	Dk to md dk gy, md to md lt gy																						Silt laminae common; sand lighter in color.
2.7	Clay shale		S	Bk to dk gy																						Darker at base.
3.1	Silty clay shale		S	Md dk to md gy																						Few plant fragments.
0.5	Sand-silt laminite		G	Md dk to md lt gy																						Plant fragments common.
3.5	Silt shale		G	Md dk to md lt gy																						Few sandy laminae.
0.6	Sandstone		G	Md to lt gy																						Very fine grained, calcareous.
1.0	Sand-silt laminite		G	Md dk to lt gy																						Sand lighter color and calcareous.
2.6	Silt shale		G	Md dk to lt gy																						Common sandy laminae.
2.2	Sand-silt laminite		G	Md dk to lt gy																						Few plant fragments.

SITE/STATION NO. 64-42 (page 4)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):
MINE:	LONG. °W:	TWP.:
PERMIT:	GEOLOGIST:	15' QUADRANGLE:
		JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:
REPORTED COAL NAMES:		WEATHERING:

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.1	Clay shale		S	Dk to md gy																						Few silt laminae in upper 2'.
1.7	Coal (Middle Kittanning)		S	Bk to gy bk	B			X		X	X		D-MD	2.8	34.6	56.3	6.3	5.3	77.7	1.4	7.8	1.5	13930	8	2300	Few pyrite blebs.
	NOTE: THIS 83.4 FOOT INTERVAL NOT INCLUDED.																									
11.0	Sandstone			Lt gy																						Profuse mica streaks, few coaly streaks.
12.8	Clayey siltstone		U	Md gy																						Two siderite bands.
4.1	Silt shale		G	Md gy																						Common plant fragments.
1.2	Sand-silt laminite		G	Md dk gy, md lt to lt gy																						Abundant plant material. Sand lighter color.
5.85	Silt shale		G	Md dk gy																						Abundant plant material.
4.0	Sand-silt laminite		G	Md dk gy, md lt to lt gy																						Plant fragments common, sand lighter color.
2.75	Sandstone		S	Lt ol gy																						Fine to medium grained.
0.35	Bony coal		S	Bk																						Tough. Rare pyrite lenses.
0.3	Sandstone		S	Md lt to lt gy																						Medium to coarse grained; coal lamina.
4.85	Silt shale		U	Bns bk																						Few plant fragments.

SITE/STATION NO. 64-42 (page 5)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

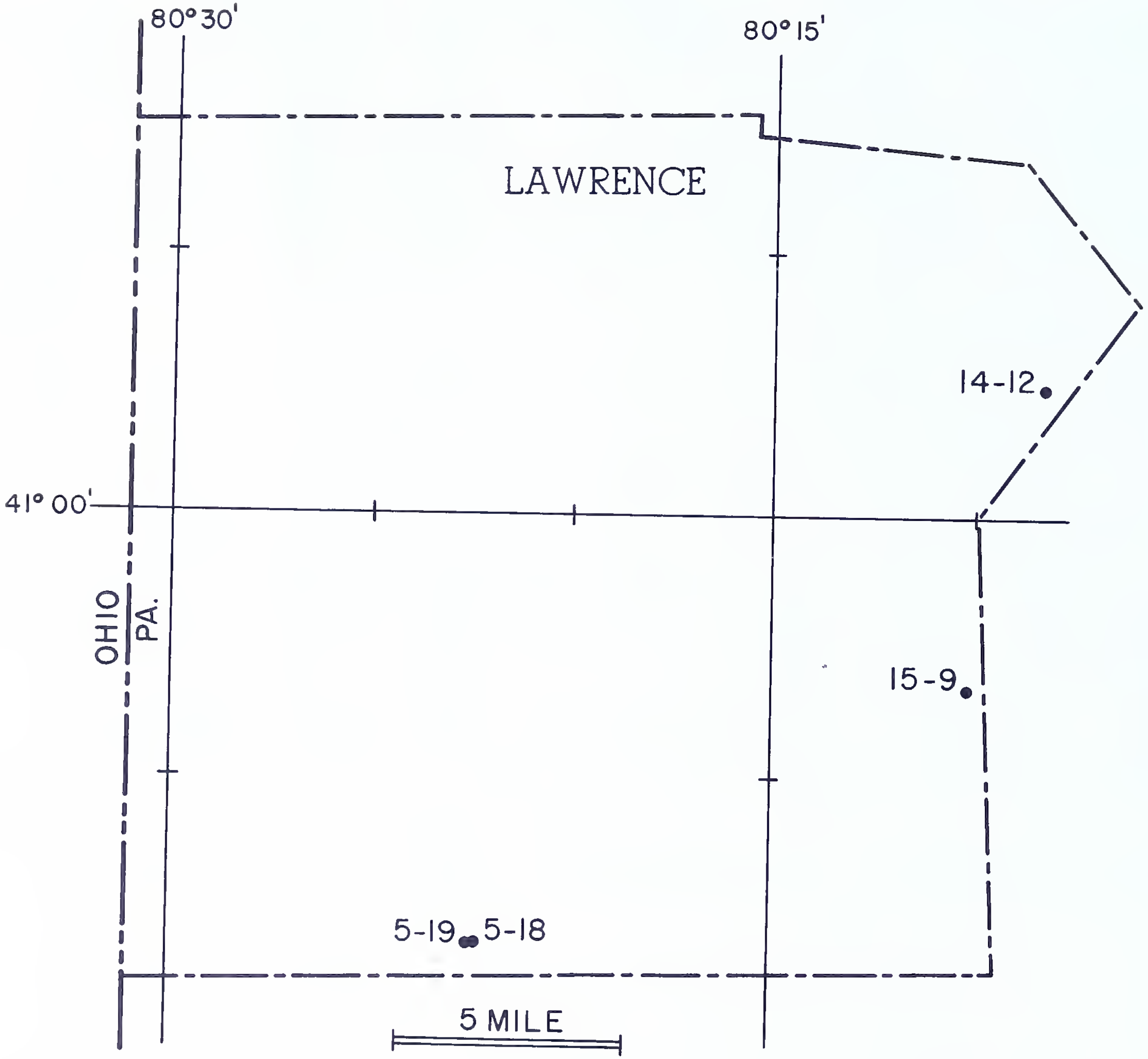
STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0	Sand-silt laminite		G	Md dk gy, md lt to lt gy																						Sand predominates; sand lighter in color.
11.5	Clay shale		U	Gy bk to md dk gy																						Abundant siderite nodules and bands.
2.2	Coal (Clarion)		S	Bk	B		X	X			X	X	M-B	1.1	31.6	42.4	24.9	4.2	60.1	0.9	3.8	6.1	10980	6	2260	Few pyrite and shale partings.
3.4	Claystone		S	Ol gy, dk gn gy																						Abundant rootlets; slickensides.
3.2	Siltstone		G	Ol gy																						Plant fragments common, rare rootlets.
3.0	Sandy siltstone		G	Md dk gy, ol gy																						Sandy zones.
1.9	Sandy siltstone or silt shale		G	Md dk to md lt gy																						Sand laminae common.
1.2	Sandstone		G	Md dk gy, md lt to lt gy																						Silt laminae common; silt darker.
0.8	Silt shale		G	Md dk to md lt gy																						Sandy laminae common.
0.9	Sandstone		G	Lt gy																						Fine grained.

SITE/STATION NO. 64-42 (page 6)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0	Silt shale		G	Dk to md dk gy, md lt to lt gy																						Sandy laminae common; few plant fragments; shale darker.
1.7	Sandstone		G	Md dk gy, lt gy																						Fine grained; silt laminae with plant fragments common; silt darker.
81.5	Sandstone		G	Md to vy lt gy																						Fine to coarse grained; few coaly laminae.
4.4	Carbonaceous claystone		S	Gy bk to md dk gy, ol gy																						Carbonized rootlets common; plastic; abundant slickensides.
6.5	Clay shale		G	Gy bk to md dk gy																						Rare pyritized plant stems; siderite bands and nodules common.
0.6	Silt shale		G	Gy bk to md dk gy																						Coaly lenses near base.
0.8	Coal (Mercer)		S	Bk	M				X		X	X	MB-M	1.5	32.3	53.3	12.9	4.6	71.3	1.1	4.5	5.6	12870	5	2030	Few pyrite lenses.

SITE/STATION NO. 65-20	COUNTY: Jefferson		COAL SAMPLE NO(S).: 405941/785741/1A, 405941/785741/1B, 405941/785741/1C
COMPANY: Glenn Coal Co.	LAT. °N: 40°59'41"	ELEV. (base lower coal): Appx. 1510'	
MINE:	LONG. °W: 78°57'41"	TWP.: Young	
PERMIT: 343-15	GEOLOGIST: WAB, ADG	15' QUADRANGLE: Punxsutawney	JOINTING: Coal - N68W, N29E
SAMPLING METHOD: Channel	DATE: 6-24-71	7 1/2' QUADRANGLE: Punxsutawney	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Claystone		G	Lt ol gy																						Occurs in pockets in top of unit below.
<10.0	Siltstone		S	Lt ol gy, md to md dk gy																						Siderite nodules rare.
2.7	Claystone		S	Lt ol gy, md to md dk gy																						Rare carbonized plant fragments.
3.5	Clay shale	0.25	S	Bk to gy bk																						Thin coaly lenses common. Bark impressions. Bony.
	Coal	0.75	S	Bk	B		x				x	x	M-MB	1.4	29.0	53.7	15.9	4.6	69.9	1.2	6.8	1.6	12390	8½	2790	
	Coal (fusain) parting	0.05	S	Bk	N				x				D-MD													
	Coal	2.0	S	Bk	B		x				x		M-MB	1.2	33.9	58.8	6.1	5.3	79.4	1.5	5.3	2.4	14240	9	2180	
	Clay shale parting	0.05	S	Bk																						Carbonaceous. Tough. Few thin coaly lenses.
	Coal	0.4	S	Bk	B		x				x		B-MB	1.3	27.6	52.9	18.2	4.5	68.5	1.2	5.7	1.9	12160	8	2620	


80°30'
80°15'
LAWRENCE
14-12
41°00'
OHIO
PA.
15-9
5-19
5-18
5 MILE

SITE/STATION NO. 5-18	COUNTY: Lawrence		COAL SAMPLE NO(S).: 405150/802220/2A, 405150/802220/2B
COMPANY: Medusa Cement Co.	LAT. °N: 40°51'50"	ELEV. (base lower coal): Appx. 1160'	
MINE:	LONG. °W: 80°22'20"	TWP.: Big Beaver	
PERMIT: 360-2	GEOLOGIST: ADG	15' QUADRANGLE: New Castle	JOINTING: Clay shale: N89W
SAMPLING METHOD: Channel	DATE: 9-1-71	7 1/2' QUADRANGLE: Beaver Falls	
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.5	Limestone		G	Md gy																						Unit covered by soil. One bed, appears to be persistent.
8.0	Claystone		G	Md gy																						Lower 3' resembles clay shale.
14.0	Sandstone		S	Lt bls gy																						Fine to very fine grained. Carbonaceous material common.
28.0	Clay shale		S	Md to md dk gy																						Siderite nodules and bands common in upper half of unit.
2.4	Coal	0.9	S	Bk	B		X				X		M-MB	2.8	38.6	52.1	6.5	5.3	75.6	1.4	9.1	2.1	13500	7	2300	
	Bone	0.1	S	Bk																						Parting. Tough.
	Coal	1.4	S	Bk	B		X				X		M-MB	2.7	35.0	50.3	12.0	5.0	71.2	1.3	8.5	2.0	12630	7	2580	Two thin discontinuous clay layers.
0.1+	Claystone			Md dk gy																						Stigmaria common. Mine floor.

SITE/STATION NO. 5-19
COUNTY: Lawrence
COAL SAMPLE NO(S).: 405150/802226
COMPANY: Medusa Cement Co.
LAT. °N: 40°51'50"
ELEV. (base lower coal): Appx. 1210'
MINE:
LONG. °W: 80°22'26"
TWP.: Big Beaver
PERMIT: 360-2
GEOLOGIST: ADG
15' QUADRANGLE: New Castle
JOINTING:
SAMPLING METHOD: Channel
DATE: 9-1-71
7 1/2' QUADRANGLE: Beaver Falls
REPORTED COAL NAMES: Lower Freeport
WEATHERING: Fresh

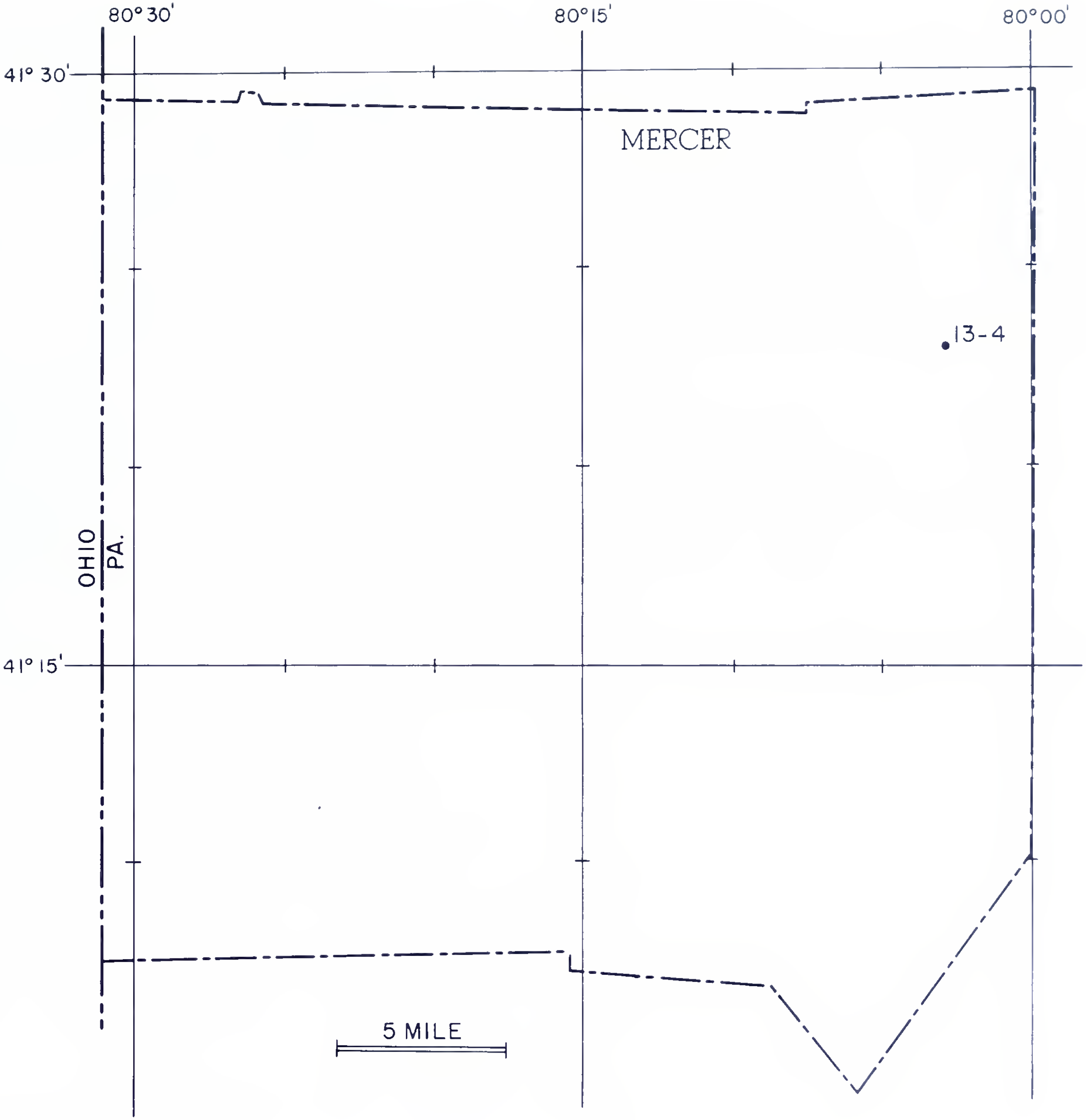
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0+	Silt shale		G	Lt ol gy																						Soil cover, with 1' of reddish clay near top.
6.0	Sandstone		G	Lt ol gy																						Fine grained. Massive.
9.0	Siltstone		S	Lt ol bn																						
0.2	Coal		S	Bk																						Weathered.
24.0	Claystone		S	Lt ol gy to ol gy																						Stigmaria and slickensides common. Limestone nodules common near middle.
15.0	Sandstone		G	Md lt gy to lt bls gy																						Medium to fine grained. Lower part is thin bedded, upper part massive.
3.0	Claystone		S	Lt ol gy, dk gy																						Slickensides common.
5.0	Coal		S	Bk	B			X			X	X	M-MB	3.5	38.1	53.4	5.0	5.5	76.6	1.5	9.6	1.8	13640	7½	2140	Upper 0.6' slightly bony, tough. Shale parting 0.9' above base.
0.5+	Claystone			Md dk gy																						Slickensides and carbonized rootlets common. Mine floor.

SITE/STATION NO.	14-12	COUNTY: Lawrence		COAL SAMPLE NO(S).:	410231/800813/2A, 410231/800813/2B
COMPANY:	Willowbrook Mining Co.	LAT. °N: 41°02'31"	ELEV. (base lower coal): Appx. 1260'		
MINE:	Doughty Mine	LONG. °W: 80°08'13"	TWP.: Plain Grove		
PERMIT:	130-5	GEOLOGIST: ADG	15' QUADRANGLE: Mercer	JOINTING:	
SAMPLING METHOD:	Channel	DATE: 7-29-69	7 1/2' QUADRANGLE: Harlansburg		
REPORTED COAL NAMES:	Lower Kittanning			WEATHERING:	Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16.0+	Clay shale		G	Dk gy to bk																						Invertebrate fossil (Lingula sp.)
10.5	Clay shale		S	Md gy																						Abundant plant material.
0.3	Sandstone		S	Lt gy																						Carbonaceous material.
4.1	Clay shale		S	Md gy																						Abundant siderite bands.
3.05	Coal	0.8	S	Bk	B			X			X	X	D-MD	1.8	38.1	48.6	11.5	5.2	72.0	1.5	7.2	2.6	12890		2090	Bony, tough.
	Coal	2.25	S	Bk	B		X				X		M-MB	2.1	37.3	52.3	8.3	5.1	74.5	1.5	8.2	2.4	13230		2190	Pyrite lenses.
0.2+	Claystone			Md dk gy																						Mine floor; becomes tan at bottom.

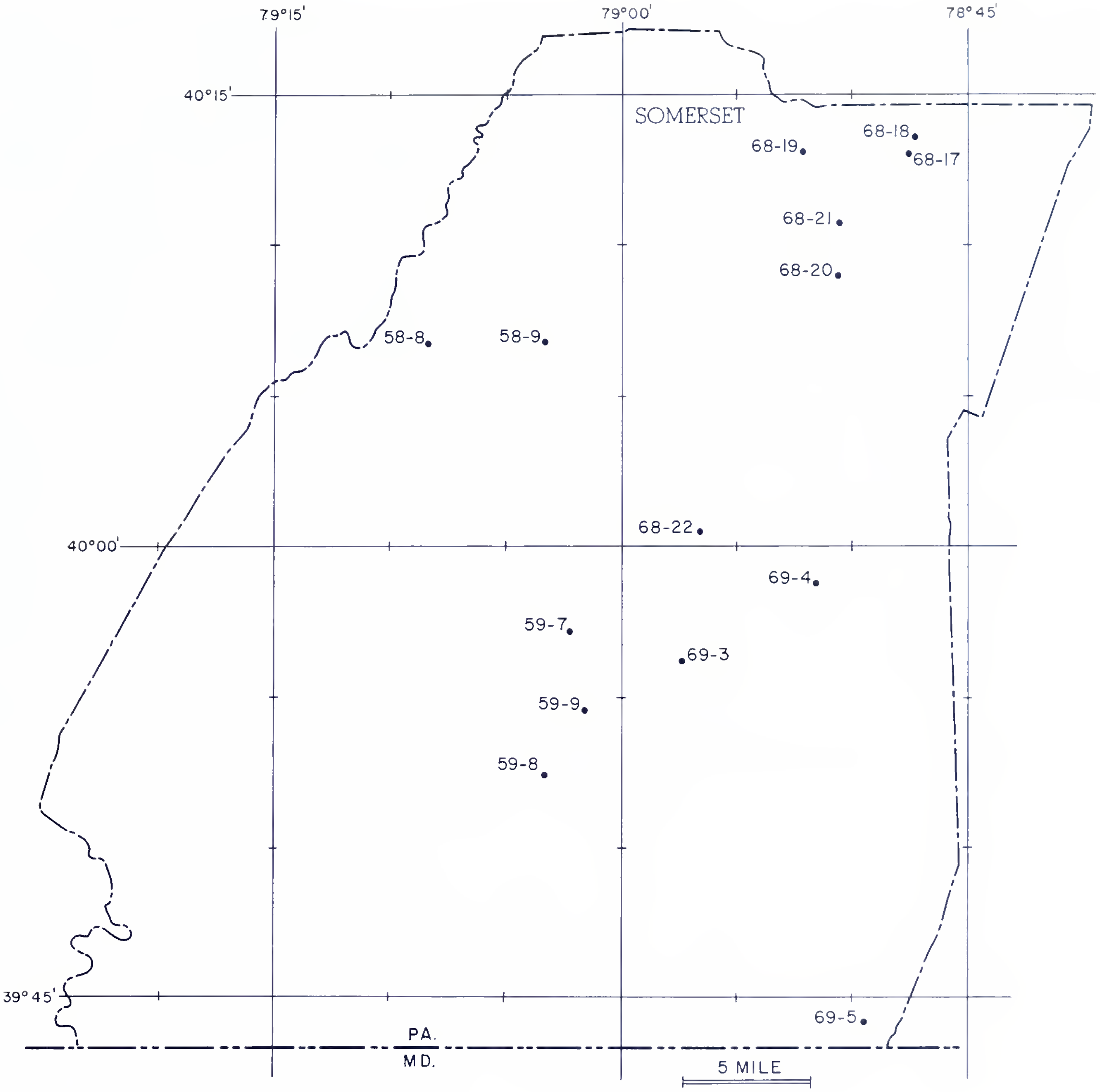
SITE / STATION NO.	15-9	COUNTY:	Lawrence		COAL SAMPLE NO(S).: 405644/801005/2A, 405644/801005/2B
COMPANY:	Secham Limestone Ind., Inc.	LAT. °N: 40°56'44"	ELEV. (base lower coal): Appx. 1300'		
MINE:		LONG. °W: 80°10'05"	TWP.: Slippery Rock		
PERMIT:	588-1	GEOLOGIST: ADG	15' QUADRANGLE: Zelienople		JOINTING: Silt shale: N28W, N22E, N84E
SAMPLING METHOD:	Channel	DATE: 8-31-71	7 1/2' QUADRANGLE: Portersville		
REPORTED COAL NAMES:	Middle Kittanning				WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
																										Note: This highwall inaccessible.
30.0	Sandstone																									Soil cover on top. Fine to medium grained. Regular bedding.
26.0	Silt shale		S	Md dk gy																						
2.4	Coal	0.9	S	Bk	B			X				X	M-MD	4.7	34.9	44.6	15.8	5.0	63.9	1.2	10.5	3.6	11550	3	2130	Pyrite lenses 0.6' below top.
	Coal	0.9	S	Bk	B	X				X	X		M-MB	7.2	35.1	53.7	4.0	5.0	72.1	1.4	15.8	1.2	12660	2	-	
0.5+	Clay		S	Vy lt gy																						Soft, plastic.


80° 30'
80° 15'
80° 00'
41° 30'
41° 15'
MERCER
13-4
OHIO
PA.
5 MILE

SITE/STATION NO. 13-4	COUNTY: Mercer		COAL SAMPLE NO(S).: 412301/800253/1B
COMPANY: Miller & McKnight Coal Co.	LAT. °N: 41°23'01"	ELEV. (base lower coal): Appx. 1480'	
MINE:	LONG. °W: 80°02'53"	TWP.: Mill Creek	
PERMIT: 240-10	GEOLOGIST: ADG	15' QUADRANGLE: Stoneboro	JOINTING: Coal: N60W, N36E, N64E
SAMPLING METHOD: Channel	DATE: 9-2-71	7 1/2' QUADRANGLE: New Lebanon	
REPORTED COAL NAMES: Brookville			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
<30.0	Glacial sand and gravel																									Unconsolidated material. Locally cuts into coal.
4.8+	Coal	4.0	U	Bk	B	X					X		M-MB	3.3	45.6	43.9	7.2	5.7	72.0	1.4	11.0	2.7	13030	5	2400	Pyritized root fragments.
	Claystone	0.2	S	Dk gy																						Parting.
	Bone	0.1	S	Bk																						Tough.
	Coal	0.5+	S	Bk																						Bottom covered.


79°15'
79°00'
78°45'
40°15'
40°00'
39°45'
SOMERSET
68-18
68-19
68-17
68-21
68-20
58-8
58-9
68-22
69-4
59-7
69-3
59-9
59-8
69-5
PA.
MD.
5 MILE

SITE/STATION NO. 58-8	COUNTY: Somerset			COAL SAMPLE NO(S).: 400642/790827/2	
COMPANY: Coal Junction Coal Co.	LAT. °N: 40°06'42"	ELEV. (base lower coal): Appx. 2040'			
MINE:	LONG. °W: 79°08'27"	TWP.: Lincoln			
PERMIT: 45-8	GEOLOGIST: WEE	15' QUADRANGLE: Somerset		JOINTING: Claystone: N24W, N52E	
SAMPLING METHOD: Channel	DATE: 8-25-71	7 1/2' QUADRANGLE: Bakersville			
REPORTED COAL NAMES: Lower Kittanning				WEATHERING: Fresh	

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	VITRAIN ABUNDANCE 30-60%	VITRAIN ABUNDANCE 15-30%	VITRAIN ABUNDANCE < 15%	VITRAIN THICKNESS > 5 mm	VITRAIN THICKNESS 2-5 mm	VITRAIN THICKNESS 1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	PROXIMATE (%) VOLATILE MATTER	PROXIMATE (%) FIXED CARBON	PROXIMATE (%) ASH	ULTIMATE (%) HYDROGEN	ULTIMATE (%) CARBON	ULTIMATE (%) NITROGEN	ULTIMATE (%) OXYGEN	ULTIMATE (%) SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1+	Coal blossom																									Weathered.
13.0	Silt shale		S	Ol bn																						Inaccessible. Weathered.
2±	Coal		S	Bk																						Inaccessible.
4.0	Underclay		S	Stained yl or.																						Weathered.
25	Sandstone		G	Lt gy																						Hard. Very clean. Parallel to rippled bedding.
15.5	Silty claystone		G	Md dk gy																						Siderite nodules to 0.1'.
2.65	Coal		S	Bk	B				X			X	M	1.8	19.0	67.4	11.8	4.5	76.9	1.3	3.9	1.6	13420	9	2830	Several thin shale partings. One or two pyrite partings in top 1.0'.
-	Claystone		S	Md lt gy																						Mine floor.

SITE/STATION NO. 58-9	COUNTY: Somerset			COAL SAMPLE NO(S).: 400645/790312/2A	
COMPANY: Coal Junction Coal Co.	LAT. °N: 40°06'45"	ELEV. (base lower coal): Appx. 2010'		400645/790312/2B	
MINE: No. 8 strip	LONG. °W: 79°03'12"	TWP.: Jenner			
PERMIT: 45-2	GEOLOGIST: GBG	15' QUADRANGLE: Somerset		JOINTING: Coal: N82W, N20W, N20E, N77W;	
SAMPLING METHOD: Channel	DATE: 8-22-69	7 1/2' QUADRANGLE: Somerset		shale: N71W, N7W, N50W, N86W, N37E	
REPORTED COAL NAMES: Middle Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.0+	Interbedded sandstone and flint clay		S	Md gy and lt ol gy																						Irregular bedding. Poor exposure.
8.0	Silt-clay laminite		G	Lt ol gy and ol gy																						Plant fossils.
10.0	Sandstone		U	Md lt gy																						Irregular bedding. Very fine grained.
2.2	Claystone		S	Dk gy																						Siderite nodules to 0.7'.
0.5	Silt shale		S	Dk gy																						Invertebrate fossils (*Orbiculoidea* sp., *Lingula* sp.). Carbonaceous material.
4.0	Sand-silt laminite		G	Md dk gy and md lt gy																						Very fine grained. Plant fossils.
11.0	Silt shale		G	Md dk gy																						Siderite laminae. Plant fossils.
3.5	Silt-clay laminite shale		S	Dk gy to md dk gy																						Siderite nodules and bands to 0.05'. Plant fossils.
3.4	Bony coal	0.5	G	Bk	B				X		X		MD	0.5	15.6	50.9	33.0	3.4	57.1	0.9	3.0	2.6	9900	4	2730	
	Coal	2.9	S	Bk	B		X				X	X	M-MB	0.4	16.4	68.6	14.6	4.0	75.2	1.2	1.4	3.6	13050	8½	2200	Thin pyrite partings.
2.0+	Underclay			Md dk gy to md gy																						Plant fossils. Mine floor.

SITE/STATION NO. 59-7	COUNTY: Somerset	COAL SAMPLE NO(S).: 395703/790212/2A
COMPANY: Croner Inc.	LAT. °N: 39°57'03" / ELEV. (base lower coal): 2660'±	395703/790212/2B
MINE:	LONG. °W: 79°02'02" / TWP.: Brothers Valley	
PERMIT: 148-14	GEOLOGIST: JDI / 15' QUADRANGLE: Meyersdale	JOINTING: Coal: N40W (face), N40E (butt); sandstone:
SAMPLING METHOD: Face channel	DATE: 11-6-74 / 7 1/2' QUADRANGLE: Murdock	N40E, N30E, N35W; sand-silt laminite shale: N16E, N84W
REPORTED COAL NAMES: Upper Freeport (E)		WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA					COAL ANALYSIS																					
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
30.0+	Sandstone			Lt gy																						Medium grained. Mafic minerals abundant. Plant fragments abundant. Channel cut-and-fills common.
4.0	Sand-silt laminite shale		S-U	Md lt gy, md dk gy																						Plant fragments abundant. Locally cut-out by overlying sandstone.
0.7	Sandstone		S	Lt gy																						Very fine grained, micaceous. Plant fragments abundant.
2.5	Silt-clay laminite		S	Ol gy																						Coarsens upward. Plant fragments and stems common.
0.5	Clay shale		G	Md gy																						Plant fragments rare.
3.4	Coal	2.2	S	Bk	B		X			X	X	X	MB-B	2.7	20.3	68.2	8.8	4.7	78.8	1.3	4.5	1.9	13790	9	2260	Soft, friable, with peacock coloration.
	Bone	0.2		Bn bk																						Thickens and thins but generally persistent.
	Coal	0.9		Bk	B		X				X	X	M	3.8	18.7	61.3	16.2	4.3	69.5	1.2	5.8	3.0	12300	9	2160	Friable, soft, splintery, with peacock coloration. Pyrite common.
	Bone	0.1		Bn bk																						
	Claystone (underclay)		S	Bn gy																						Rootlets common.

SITE/STATION NO. 59-8	COUNTY: Somerset		COAL SAMPLE NO(S).: 395230/790318/2, 395230/790318/6A, 395230/790318/6B
COMPANY: Manor Hill Coal Co.	LAT. °N: 39°52'18"	ELEV. (base lower coal): Appx. 2180'	
MINE: Garrett	LONG. °W: 79°03'18"	TWP.: Summit	
PERMIT: 176-1	GEOLOGIST: GBG	15' QUADRANGLE: Meyersdale	JOINTING: Coal: N41W, N78W, N50E, N27E, N75W; shale: N72W, N80W, N43E, N35W
SAMPLING METHOD: Channel	DATE: 8-20-69	7 1/2' QUADRANGLE: Meyersdale	
REPORTED COAL NAMES: Upper Freeport, Upper Freeport rider			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
27+	Sandstone			Lt gy																						Fine to medium grained. Crossbedding.
20	Siltstone		U	Dk gy to md dk gy																						Plant fossils. Irregular bedding.
2.5	Coal	1.7	S	Bk	B		X				X	X	M-MD	0.5	19.4	66.7	13.4	4.4	76.8	1.4	3.2	0.8	13410	9	Above 2910	Splintery.
	Claystone	0.2	S	Gy bk																						
	Coal	0.6	S	Bk	B			X			X	X	MD-MB	0.5	19.6	63.7	16.2	4.2	73.2	1.4	2.7	2.3	12830	9	2670	Cubic fracture.
0.2	Claystone		S	Md dk gy																						
1.3	Underclay		S	Md gy to md lt gy																						Plastic.
3.5	Sand-silt laminite		G	Md dk and md gy																						Silt - md dk gy Sand - md gy
8.5	Claystone		G	Dk gy to md dk gy																						
2.5	Clay shale		S	Gy bk to dk gy																						
2.1	Coal		S	Bk	B		X				X	X	MD-MB	0.4	19.2	69.7	10.7	4.5	79.7	1.5	2.9	0.7	13850	9	Above 2910	
0.1+	Claystone		S																							Mine floor.

SITE/STATION NO.:	59-9	COUNTY:	Somerset		COAL SAMPLE NO(S).: 395432/790135/2A 395432/790135/2B
COMPANY:	Ponfeigh Coal Co.	LAT. °N: 39°54'32"	ELEV. (base lower coal): Appx. 2280'		
MINE:		LONG. °W: 79°01'35"	TWP.: Brothers Valley		
PERMIT:	169-3, 3366BSM84	GEOLOGIST: GBG	15' QUADRANGLE: Meyersdale		JOINTING: Coal: N47E, N48W, N29W, N60E; shale: N52E, N47W, N70E
SAMPLING METHOD:	Channel	DATE: 8-20-69	7 1/2' QUADRANGLE: Rockdale		
REPORTED COAL NAMES:	Upper Freeport rider				WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0	Sandstone		U	Lt gy																						Fine to medium grained. Crossbedding.
0.5	Claystone		G	Md lt gy to lt gy																						Soft and plastic.
3.5	Sand-silt laminite		G	Md dk gy and md lt gy																						Plant fossils.
3.3	Siltstone		S	Dk gy to md dk gy																						Plant fossils.
0.5-0.8	Sandstone		S	Md lt gy																						Very fine to fine grained.
3.8	Sand-silt laminite		G	Md dk gy and md lt gy																						
0.5	Silt-clay laminite shale		S	Dk gy to md dk gy																						
2.55	Coal	1.6	S	Bk	B		X				X	X	M-MD	0.5	18.7	68.5	12.3	4.3	77.3	1.4	2.8	1.9	13520	9	2620	
	Claystone	0.25	S	Md dk gy																						
	Coal	0.7	S	Bk	B		X				X	X	M-MD	0.6	17.6	58.7	23.1	3.8	66.6	1.2	2.5	2.8	11630	8½	2530	
0.5+	Underclay			Md dk gy																						Mine floor.

SITE/STATION NO.	68-17	COUNTY:	Somerset	COAL SAMPLE NO(S).:	401258/784736/2A 401258/784736/2B
COMPANY:	Myron Shaffer	LAT. °N: 40°12'58"	ELEV. (base lower coal): 2085'±		
MINE:		LONG. °W: 78°47'36"	TWP.: Paint		
PERMIT:	359-4	GEOLOGIST: JDI	15' QUADRANGLE: Windber	JOINTING:	Coal: N65W (face), N30E (butt), N65W, N35E (50SE); silt-clay laminite: N80E, N75E, N25W, N16W
SAMPLING METHOD:	Face channel	DATE: 11-7-74	7 1/2' QUADRANGLE: Windber		
REPORTED COAL NAMES:	Lower Kittanning rider (B-rider)			WEATHERING:	Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
20.0±	Silt-clay laminite		G	Md lt gy, dk gy																						Silt layers distinctly thicker (to 1" thick). Planar even bedding. Plant fragments frequent.
0.5	Silt-clay laminite shale		G	Md gy, dk gy																						Planar, even bedding.
0.2	Clay shale		S	Gy bk																						Pyrite rare.
3.2	Bony coal	0.8		Bk, gy bk	B			X				X	D	2.8	15.0	51.8	30.4	3.5	57.5	1.0	5.6	2.0	9990	2½	2630	Blocky, hard. Pyrite rare.
	Coal	1.7		Bk	B		X				X	X	D-MB	3.6	17.0	72.7	6.7	4.4	81.3	1.3	5.5	0.8	14030	7	2740	Thin ashy layers frequent. Vitrain bands thinner toward top.
	Bone	0.1		Gy bk																						Persistent parting. Plant impressions common.
	Coal	0.6	S	Bk	B				X			X	D-MD													Somewhat bony. Soft, friable in places. Mined, but not sampled.
	Claystone (underclay)			Ol bk																						Rootlets abundant.

SITE/STATION NO. 68-18 (page 1)
COUNTY: Somerset
COAL SAMPLE NO(S).: 401337/784712/2A, 401337/784712/2B, 401337/784712/5A, 401337/784712/5B
COMPANY: W. E. Scurfield
LAT. °N: 40°13'37"
ELEV. (base lower coal): 2200'±
MINE:
LONG. °W: 78°47'12"
TWP.: Paint
PERMIT: 256B
GEOLOGIST: JDI
15' QUADRANGLE: Windber
JOINTING: Coal (C'): N10E (58SE), N10E (45SE), N80W; D: N15W, N75E
SAMPLING METHOD: Face channel
DATE: 11-7-74
7 1/2' QUADRANGLE: Windber
REPORTED COAL NAMES: Upper Kittanning (C'), Lower Freeport (D)
WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Bonded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0±	Sand-silt laminite shale		G	Md lt gy																						Thick siltstone beds common.
6.0	Sandstone		S	Md gy																						Fine grained, with rounded clay galls rare in some beds. Plant fragments common.
3.9	Silt-clay laminite shale		S	Dk gy										These units involved in large-scale penecontemporaneous slumping.												Fissile to platy.
0-1.6	Sandstone		S	Md gy																						Fine grained, with rounded clay galls common at base. Discontinuous.
1.1	Silt-clay laminite shale			Dk gy, md gy																						
3.6	Coal	0.8		Bk	B		X				X	X	M	7.3	18.0	68.9	5.8	4.7	77.8	1.3	9.6	0.8	13380	2	2830	Weathered, soft, friable.
	Bone	0.1		Gy bk																						
	Coal	1.8		Bk	B		X					X	M	4.7	16.3	72.3	6.7	4.7	79.1	1.4	6.8	1.3	13610	4	2480	Weathered, soft, friable.
	Clay shale	0.1		Gy bk																						Silty. Carbonaceous.
	Coal	0.8	S	Bk	B			X				X	M-MB													Bony at base. Mined, but not sampled.
0-3.0	Claystone (underclay)			Md gy																						Plastic, soft, some hard nodules to 2" maximum diameter. Rootlets common.

SITE/STATION NO. 68-18 (page 2)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0-3.0	Limestone		G	Lt gy																						Freshwater. Locally grades into claystone. Angular to rounded fragments (to 3/4" diameter) in darker matrix.
2.5	Claystone (underclay)		G	Md gy																						Rootlets common.
3.0	Claystone (underclay)		G	Lt gy																						Rootlets common. Grades locally into highly calcareous claystone or limestone.
2.9	Claystone (underclay)		G	Md gy																						Sandy at base. Rootlets common.
4.0	Sandstone		G	Lt gy																						Fine grained, clayey. Well jointed.
1.2	Sand-silt laminite shale		G	Md gy																						Mostly silt shale, with very thin sandy laminae.
2.2	Sandstone		G	Lt gy																						Very fine grained, with thin silty beds between sandstone beds.
2.0	Siltstone		G	Md lt gy																						Clayey. Massive.
0.7	Silty clay shale		G	Gy bk																						Carbonaceous, with pyrite abundant.

SITE/STATION NO. 68-18(page 3)
COUNTY:
COAL SAMPLE NO(S).:
COMPANY:
LAT. °N:
ELEV. (base lower coal):
MINE:
LONG. °W:
TWP.:
PERMIT:
GEOLOGIST:
15' QUADRANGLE:
JOINTING:
SAMPLING METHOD:
DATE:
7 1/2' QUADRANGLE:
REPORTED COAL NAMES:
WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mod-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0	Coal	0.4	G	Bk	B		X				X	X	M	4.0	17.1	66.1	12.8	4.2	72.1	1.3	4.6	5.0	12860	8½	2080	Pyrite common.
	Claystone (underclay)	0.8		Md dk gy, ol gy																						Silty. Rootlets abundant.
	Coal	3.8		Bk	B			X			X	X	M-MB	3.0	17.7	72.5	6.8	4.4	80.4	1.4	4.9	2.1	13990	9	2210	Upper 0.3' bony, with pyrite common.
	Claystone (underclay)		S	Lt ol gy																						Rootlets common.

SITE/STATION NO. 68-19 (page 1)
COMPANY: East Ridge Mining Co.
MINE:
PERMIT: 720-1
SAMPLING METHOD: Face channel
REPORTED COAL NAMES: Lower Freeport (D)

COUNTY: Somerset
LAT. °N: 40°13'00"
LONG. °W: 78°52'05"
GEOLOGIST: JDI
DATE: 11-8-74
ELEV. (base lower coal): 1880'±
TWP.: Paint
15' QUADRANGLE: Windber
7 1/2 QUADRANGLE: Windber

COAL SAMPLE NO(S).: 401300/785205/2A, 401300/785205/2B, 401300/785205/2C
JOINTING: Coal: N15W (face), N60E (butt)
WEATHERING: Fresh to weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
10.0±	Overburden																									
6.0±	Sandstone		S	Pale yl bn																						Silty, very fine grained. Plant stems abundant.
10.0	Sandstone		U	Md lt gy																						Pebbly, medium grained, siliceous. Plant fragments common.
1.8	Clay shale		G	Dk gy																						Deeply weathered. Pyritic siderite nodules common.
2.5	Claystone (underclay)			Md lt gy																						Silty. Rootlets common.
20.0±	Sand-silt laminite		S																							
1.0	Silty claystone		S	Gy bk																						Carbonaceous. Pyrite common. Plant fragments common.
2.9	Sand-silt laminite		G	Lt gy, md dk gy																						Clayey. Plant fragments, leaves abundant (Lepidophylloides frequent).
0.1	Silt-clay laminite shale			Bn bk																						Carbonaceous.

SITE/STATION NO. 68-19 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3.4	Coal	0.9	G	Bk	B		X				X	X	MB	3.3	18.7	67.9	10.1	4.4	77.0	1.3	4.4	2.8	13390	9	2030	Pyrite common. Bony layer (0.1' thick) 0.7' above base.
	Bone	0.2		Bn bk																						Persistent, but varies in thickness.
	Coal	1.7		Bk	B			X			X	X	M-MB	3.3	14.8	71.0	10.9	4.3	75.4	1.3	4.9	3.2	13230	8½	2290	Pyrite common.
	Bone	0.1		Bn bk																						Hard.
	Coal	0.5		Bk	B			X			X	X	MB-B	2.7	16.5	64.4	16.4	4.0	69.4	1.1	-	7.2	12330	8	2050	Soft, friable, with very thin clay partings rare.
0.2±	Claystone (underclay)		S	Md gy																						Moderately hard. Rootlets common.
	Limestone		G	Md dk gy																						Clayey. Grades into claystone.

SITE/STATION NO. 68-20	COUNTY: Somerset		COAL SAMPLE NO(S).: 400858/785033/2A, 400858/785033/2B
COMPANY: P. B. S. Coals, Inc.	LAT. °N: 40°08'58"	ELEV. (base lower coal): Appx. 2290'	
MINE:	LONG. °W: 78°50'33"	TWP.: Shade	
PERMIT: 222-15	GEOLOGIST: GBG	15' QUADRANGLE: Windber	JOINTING: Coal: N75W, N10W, N45W, N43E;
SAMPLING METHOD: Channel	DATE: 8-21-69	7 1/2' QUADRANGLE: Northeast	shale: N63E, N39E, N78W
REPORTED COAL NAMES: Upper Kittanning			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0±	Coal blossom			Bk																						
3.0	Underclay		?	Lt gy to vy lt gy																						Limonite nodules to 0.1'.
2.0	Cover																									
2.5	Sand-silt laminite shale			Gn gy																						
7.5	Silt-clay laminite shale		G	Gn gy																						Limonite concretions to 0.5'.
7.0	Claystone		G	Dk gy to gy bk																						Siderite lenses to 0.3'. Brecciated. Partly carbonaceous.
4.0	Claystone		G	Dk gy																						Plant fossils.
4.5	Siltstone		G	Dk gy to md dk gy																						Siderite and limonite nodules to 1/8".
1.0	Sand-silt laminite shale		G	Md lt gy and md dk gy																						Plant fossils.
11.0	Sandstone		S	Lt gy																						Fine to medium grained.
3.5	Clay shale		U	Gy bk to dk gy																						Plant fossils.
3.1	Coal	0.7	S	Bk										0.5	16.6	66.7	16.7	4.0	74.0	1.3	2.5	2.0	12840	5½	2530	Bone and shale partings.
	Coal	2.4	G	Bk	B		X				X		MB-MD	0.6	16.8	73.4	9.2	4.3	80.7	1.5	2.5	1.8	14010	9	2590	Splintery.
-	Underclay		S																							Mine floor.

SITE/STATION NO. 68-21 (page 1)	COUNTY: Somerset		COAL SAMPLE NO(S).: 401038/785047/4A, -/4B, -/4C
COMPANY: M. F. Fetterolf Coal Co.	LAT. °N: 40°10'38"	ELEV. (base lower coal): Appx. 1930'	
MINE:	LONG. °W: 78°50'37"	TWP.: Paint	
PERMIT: 216-24	GEOLOGIST: WEE	15' QUADRANGLE: Windber	JOINTING: Shales: N85W, N7E, N47E
SAMPLING METHOD: Channel	DATE: 8-25-71	7 1/2' QUADRANGLE: Windber	
REPORTED COAL NAMES: Clarion - Brookville and Lower Kittanning			WEATHERING: Fresh

THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.5+	Coal blossom		?	Bk																						
1.5	Underclay		G	Md lt gy																						Weathered.
5.5	Clayey siltstone		G	Md gy																						
16	Clay shale		G	Md gy																						
3.0	Clay shale		S	Gy bk																						
0.5±	Coal		S	Bk																						Not accessible for description.
2.5	Siltstone		G	Md gy																						Plant fossils.
4.0	Underclay		G	Md lt to md gy																						Plant fossils.
28	Silty sandstone		U	Md lt gy																						Large-scale crossbedding. Plant fossils.
3.0-6.0	Silty sandstone		U	Md lt to md gy																						Plant fossils. Lenticular beds.
3.8	Coal	1.5	G	Bk	B			X			X	X	M	3.9	15.3	65.9	14.9	4.2	72.1	1.1	6.3	1.4	12410	4	Above 2910	Many thin partings. Pyrite nodules, lenses. Sulfate stain.
	Clay shale	0.1-0.2	G	Md gy																						Hard. Plant fossils.
	Coal	0.55	G	Bk	B			X			X	X	M	1.9	15.5	70.1	12.5	4.1	76.8	1.2	4.1	1.3	13180	3½	Above 2910	
	Claystone	0.2	G	Md dk gy																						Hard. Plant fossils.
	Interbedded coal and bony coal	1.4		Gy bk to bk	M		X					X	B-MD	1.4	14.7	62.7	21.2	3.7	68.8	3.7	4.4	0.8	11790	5	Above 2910	70% nonbanded. 30% banded.

SITE/STATION NO. 68-21 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, med-bright, mid-lustrous, med-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.5-2.5	Interbedded siltstone and carbonaceous silty sandstone		S	Bk to lt gy																						Interbedded lenses to 1.0' thick and 10.0' long. Very irregular. Plant fossils. Vitrain lenses.
0.0-0.3	Coal		S	Bk	B				X			X	B													Irregular but persistent.
6.0	Siltstone to silt shale		S	Md gy to md bn gy																						Plant fossils. Lumpy.
0.6	Clayey silt shale		S	Md dk gy																						Plant fossils.
0.8	Clayey siltstone to siltstone		G	Md gy																						Plant fossils.
3.0	Sand-silt laminite shale		S	Dk gy and lt bn gy																						Plant fossils.
0.3	Clay shale		G	Gy bk																						Plant fossils.
4.5	Claystone		S	Md dk gy																						Hard.
1.1	Coal		S	Bk	B			X				X	M													High fusain. Not accessible for sample.
0.9	Claystone		S	Dk gy																						
1.1+	Coal		S	Bk																						Not accessible for description.

SITE/STATION NO. 68-22
COUNTY: Somerset
COAL SAMPLE NO(S).: 400026/785629/2
COMPANY: Zubek and Yantus
LAT. °N: 40^{0}00'26"
ELEV. (base lower coal): Appx. 2300'
MINE: Walker Strip
LONG. °W: 78^{0}56'29"
TWP.: Stony Creek
PERMIT: 332-4
GEOLOGIST: GBG
15' QUADRANGLE: Windber
JOINTING:
SAMPLING METHOD: Channel
DATE: 8-21-69
7 1/2' QUADRANGLE: Stoystown
REPORTED COAL NAMES: Lower Freeport
WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)			ULTIMATE (%)									
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
25+	Sandstone		U	Md lt to lt gy																						Plant fossils. Locally very siliceous.
2.0	Coal		S	Bk	B	X					X	X	M-MB	0.4	21.6	69.7	8.3	4.5	80.5	1.3	2.5	2.9	14110	9	2130	Splintery.
0.5+	Claystone			Md dk to md gy																						Plant fossils. Mine floor.

SITE/STATION NO. 69-3	COUNTY: Somerset		COAL SAMPLE NO(S).: 395602/785717/2A and 395602/785717/2B
COMPANY: Croner Inc.	LAT. °N: 39°56'02"	ELEV. (base lower coal): Appx. 2300'	
MINE: Berlin	LONG. °W: 78°57'17"	TWP.: Brothers Valley	
PERMIT: 148-2	GEOLOGIST: GBG	15' QUADRANGLE: Berlin	JOINTING: Shale: N36E, N68W
SAMPLING METHOD: Channel	DATE: 8-20-69	7 1/2' QUADRANGLE: Berlin	
REPORTED COAL NAMES: Pittsburgh			WEATHERING: Fresh

STRATIGRAPHIC DATA / COAL ANALYSIS

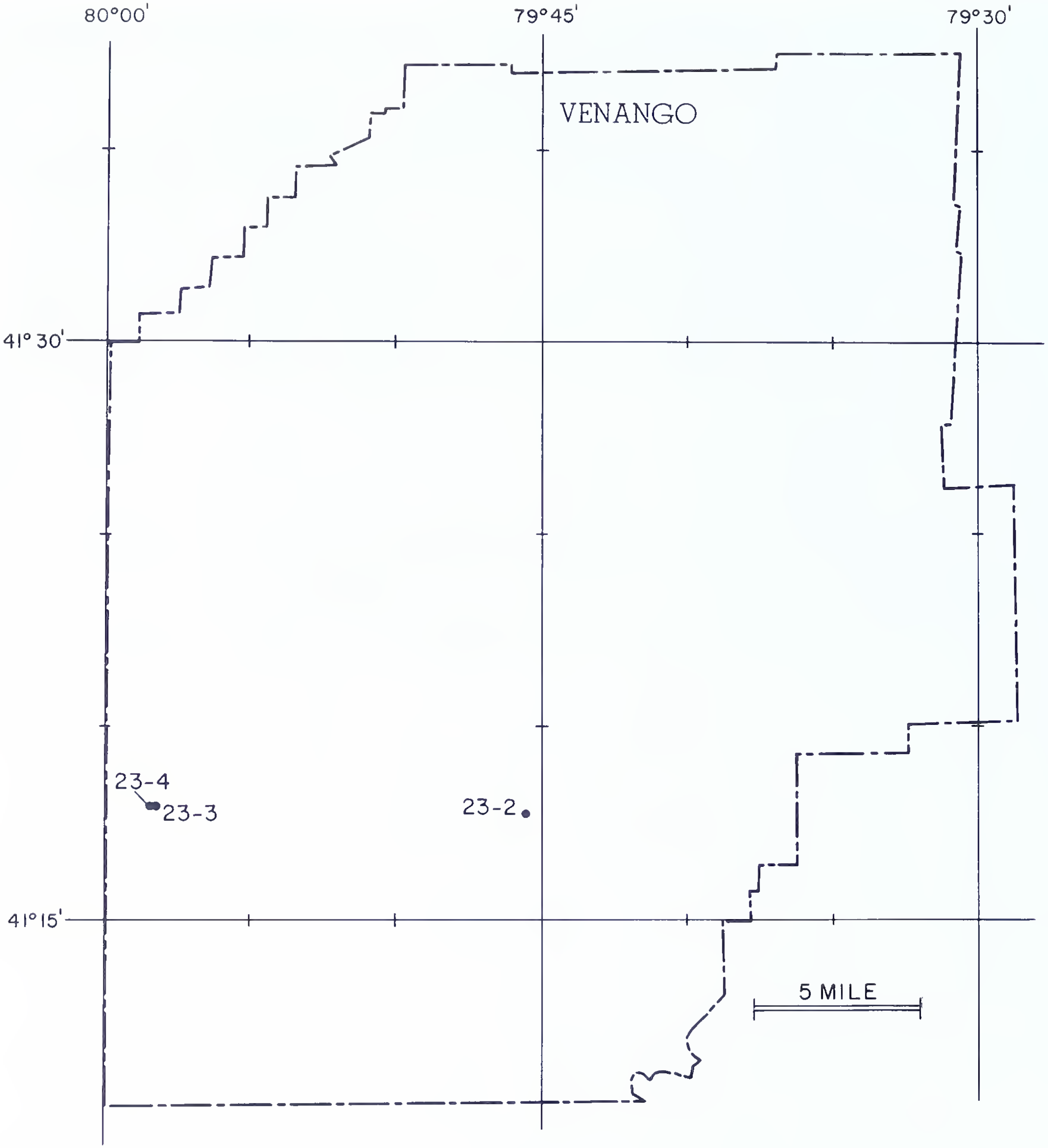
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, med-bright, med-lustrous, med-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
15.0+	Silt-clay laminite			Dk to md dk gy																						
1.5	Siderite		S	Md gy																						Oolitic. Weathers to limonitic concretions.
1.0	Clay shale		U	Dk gy to gy bk																						
0.2	Bone coal		S	Bk																						
4.1	Coal	3.1	S	Bk	B		X				X	X	MB -M	3.2	23.3	64.0	9.5	3.9	71.4	1.7	12.8	0.7	11900	NC	2740	0.4' bone 1.3' from top.
	Clay shale	0.4	S	Md dk gy																						
	Coal	0.6	S	Bk	N								M	1.2	20.8	59.6	18.4	4.0	69.5	1.7	5.7	0.7	11920	1	2620	
-	Bone coal		S	Bk																						Mine floor.

SITE/STATION NO. 69-4		COUNTY: Somerset		COAL SAMPLE NO(S).: 395846/785132/2A	
COMPANY: P.B.S. Coals Inc.		LAT. °N: 39°58'46"	ELEV. (base lower coal): Appx. 2500'	395846/785132/2B	
MINE: Speicher - Stahl		LONG. °W: 78°51'32"	TWP.: Stoney Creek		
PERMIT: 222-11		GEOLOGIST: GBG	15' QUADRANGLE: Berlin	JOINTING: Sandstone: N42W, N87E	
SAMPLING METHOD: Channel		DATE: 8-21-69	7 1/2' QUADRANGLE: New Baltimore		
REPORTED COAL NAMES: Middle Kittanning or Upper Kittanning				WEATHERING: Fresh	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clorain-Durain Luster (bright, mad-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7.0+	Underclay		G	Lt to vy lt gy																						
18.0	Sandstone		U	Lt gy																						
5.1	Coal	1.0	S	Bk	B				X		X	X	MD-D	0.6	15.3	48.3	35.8	3.2	53.8	1.3	3.1	2.8	9310	1	2780	Shale and pyrite partings.
	Coal	4.1	S	Bk	B		X				X	X	MB-MD	0.5	17.1	69.9	12.5	4.1	77.0	1.3	2.6	2.5	13370	4	2560	
-	Claystone			Bn gy																						Mine floor.

SITE/STATION NO. 69-5	COUNTY: Somerset			COAL SAMPLE NO(S).: 394408/784934/1A 394408/784934/1B	
COMPANY:	LAT. °N: 39°44'08"	ELEV. (base lower coal): Appx. 1950'			
MINE: Deep mine	LONG. °W: 78°49'34"	TWP.: Southampton			
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Frostburg		JOINTING: Shear planes in coal: N5W, dip 64SW	
SAMPLING METHOD: Channel	DATE: 9-30-70	7 1/2' QUADRANGLE: Cumberland			
REPORTED COAL NAMES: Pittsburgh				WEATHERING: Weathered	

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)									
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Claroin-Duroin Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
3+	Sandstone			Md gy																						Fine to medium grained. Plant fossils.
4.5	Interbedded carbonaceous clay shale and coal		U	Bk																						0.1' - 0.3' interbeds. 70% coal, 30% shale. Plant fossils.
4.1	Coal	1.6	G	Bk	B				X			X	M	1.8	21.5	67.1	9.6	4.4	78.3	1.8	4.8	1.1	13510	2½	Above 2910	Hard. Tough. Sheared and polished. Contorted.
	Silty clay shale	0.6	G	Dk gy																						
	Coal	1.9	S	Bk	B			X		X	X	X	MB	2.2	18.5	69.5	9.8	4.1	77.9	1.7	5.6	0.9	13470	2½	Above 2910	Granular to irregular fracture. Many thin shale and fusain partings.


80°00'
79°45'
79°30'
VENANGO
41° 30'
41° 15'
23-4
23-3
23-2
5 MILE

SITE/STATION NO.: 23-2	COUNTY: Venango		COAL SAMPLE NO(S).: 411743/794537/2A,		
COMPANY: Goetz Coal Co.	LAT. °N: 41°17'43"	ELEV. (base lower coal): Appx. 1550'	411743/794537/2B		
MINE:	LONG. °W: 79°45'37"	TWP.: Rockland			
PERMIT: 193-5	GEOLOGIST: ADG	15' QUADRANGLE: Franklin	JOINTING: Coal: N30W, N61W, N31E; clay shale: N52W,		
SAMPLING METHOD: Channel	DATE: 9-2-71	7 1/2' QUADRANGLE: Kennerdell	N65W, N12-18E		
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh		

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS													
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)										
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Grain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
38.0±	Clay shale			Ol gy to ol bk																						Soil cover on top. Invertebrate fossils (*Lingula* sp.) common near base. Abundant plant hash. Profuse siderite nodules in lower 10'. Becomes silty upward.
4.0	Coal	1.7	S	Bk	B		X				X	X	M-MB	2.5	39.8	47.8	9.9	5.3	71.4	1.4	7.3	4.7	12830	7½	2090	Pyrite lenses common.
	Coaly shale	0.1	S	Bk																						Parting.
	Coal	2.2	S	Bk	B				X			X	M-MD	3.2	26.7	34.5	35.6	3.9	47.3	0.9	9.8	2.5	8440	1½	2910+	Bony, tough. Pyrite parting to 1" thick. Several thin clay partings.
0.5+	Claystone		S	Lt ol gy																						*Stigmaria* present. Mine floor.

SITE/STATION NO. 23-3
COMPANY: Mineral Hill Corp.
MINE:
PERMIT: 515-3
SAMPLING METHOD: Channel
REPORTED COAL NAMES: Lower Kittanning

COUNTY: Venango
LAT. °N: 41°17'49"
LONG. °W: 79°58'10"
GEOLOGIST: ADG
DATE: 9-2-71

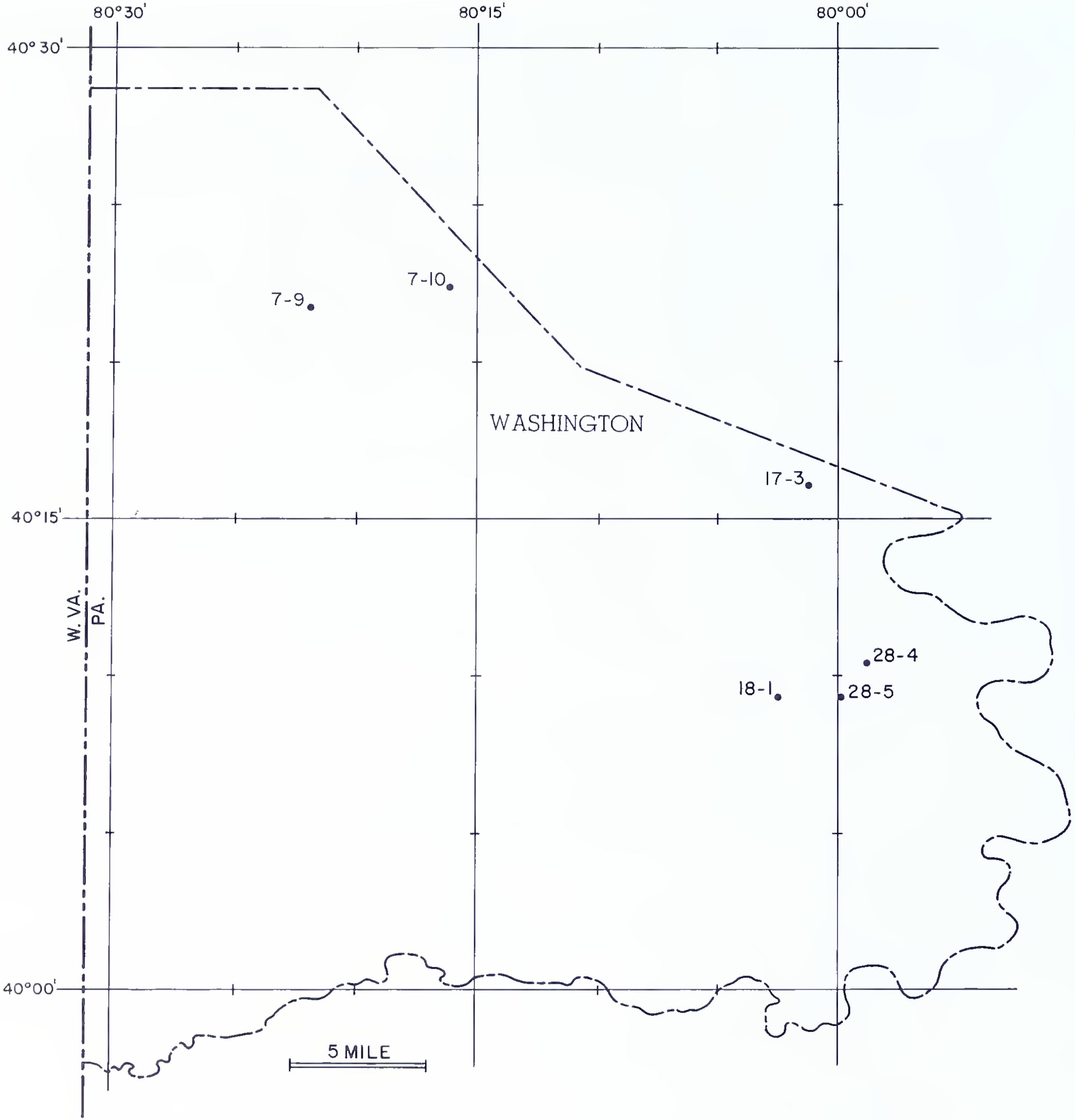
ELEV. (base lower coal): Appx. 1410'
TWP.: Mineral
15' QUADRANGLE: Franklin
7 1/2' QUADRANGLE: Polk

COAL SAMPLE NO(S).: 411749/795810/2A, 411749/795810/2B
JOINTING: Coal: N59W, N32E
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncan.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
2.0	Silt shale																									Soil on top. Weathered.
2.9	Coal	0.7	S	Bk	B				X			X	M-MB	2.6	35.2	39.8	22.4	4.7	60.1	1.0	8.2	3.6	10950	4	2190	Pyritized plant fragments common. Highly weathered.
	Claystone parting	0.7	S	Md dk gy																						
	Coal	1.5	S	Bk	B				X		X	X	M-MD	2.6	37.2	48.2	12.0	5.0	69.7	1.2	8.8	3.3	12540	4½	2450	Bony, tough at top. White pyrite on joint surfaces.
5.5	Claystone		S	Lt ol gy																						_Stigmaria_ and slickensides common. Mine floor.

SITE/STATION NO. 23-4	COUNTY: Venango		COAL SAMPLE NO(S).: 411750/795814/3A, 411750/795814/3B
COMPANY: Mineral Hill Corp.	LAT. °N: 41°17'50"	ELEV. (base lower coal): Appx. 1380'	
MINE:	LONG. °W: 79°58'14"	TWP.: Mineral	
PERMIT: 515-3	GEOLOGIST: ADG	15' QUADRANGLE: Franklin	JOINTING:
SAMPLING METHOD: Channel	DATE: 9-2-71	7 1/2' QUADRANGLE: Polk	
REPORTED COAL NAMES: Clarion			WEATHERING: Fresh

STRATIGRAPHIC DATA															COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)									
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0	Clay shale		S	Md dk to dk gy																						Few plant leaves and fragments.
<2.0	Limestone		S	Md lt gy																						Invertebrate fossils (crinoid stems and marine brachiopods) abundant.
2.0	Silt shale		S	Gys bk																						Few plant fragments.
2.0	Sandstone		S	Lt gy																						Fine to very fine grained. Carbonaceous material common.
6.0	Sand-silt laminite shale		S	Md to lt gy																						Very fine grained. Sandstone content increases upward. Plant hash common.
1.5	Coal	0.7	S	Bk	B			X			X	X	M-MB	5.8	32.0	52.0	10.2	4.8	70.1	1.1	10.6	3.2	12370	1½	2030	Abundant fusain partings.
	Bony coal	0.8	S	Bk	B				X			X	M-MD	3.1	36.0	50.5	10.4	5.1	72.0	1.3	9.4	1.8	12790	3½	2590	Tough. Lower 0.2' less bony.
0.2	Black shale		G	Dk gy to gys bk																						Few plant fragments.
0.3+	Claystone			Lt bns gy																						Stigmaria and slickensides common. Mine floor.


80°30'
80°15'
80°00'
40°30'
40°15'
40°00'
7-9
7-10
WASHINGTON
17-3
28-4
18-1
28-5
W. VA.
PA.
5 MILE

SITE/STATION NO.: 7-9 (page 1)	COUNTY: Washington		COAL SAMPLE NO(S).: 402143/802155/1B, -/1C, -/1D, -/1E, -/1F, -/1G, -/1H
COMPANY: Petricca and McElhaney	LAT. °N: 40°21'43"	ELEV. (base lower coal): Appx. 1050'	
MINE: Slack Strip	LONG. °W: 80°21'55"	TWP.: Smith	
PERMIT: 480-1	GEOLOGIST: WEE	15' QUADRANGLE: Burgettstown	JOINTING: N12E, N78W
SAMPLING METHOD: Channel	DATE: 7-11-69	7 1/2' QUADRANGLE: Midway	
REPORTED COAL NAMES: Pittsburgh			WEATHERING: Weathered to very weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
16+	Sand-silt laminite shale			Dk and md lt gy																						Sandier upward.
6	Silt-clay laminite shale		G	Gy bk and md gy																						
0.6	Clay shale		G	Gy bk																						
0.4-0.9	Coal		S	Bk	B		X	X				X	B-MB	1.5	39.2	42.2	17.1	5.1	66.4	1.4	6.6	3.4	11870	4	2150	
0.3-0.5	Silty carbonaceous clay shale		S	Gy bk																						Plant fossils.
2.3-3.2	Coal		S	Bk	B		X	X	X		X	X	M-MB	1.6	36.9	46.8	14.7	5.0	68.8	1.5	8.3	1.7	12220	5	2690	
0.1-1.0	Silty carbonaceous clay shale		G	Gy bk																						Plant fossils.
2.8-4.0	Coal	0.4-0.8	S	Bk	N		X						M-MD	1.6	35.8	45.2	17.4	4.7	65.1	1.4	6.9	4.5	11640	6	2090	
	Carbonaceous clay shale	0.1-0.2	S	Gy bk																						Bone coal lenses to 0.1'. Plant fossils.
	Coal	0.4-0.8	S	Bk	B				X			X	M-MD	1.7	36.2	47.0	15.1	4.9	67.2	1.4	7.7	3.7	11980	6½	2190	
	Silty carbonaceous clay shale	0.1-0.2	S	Gy bk																						Plant fossils.
	Coal	0.7-0.8	S	Bk	B				X			X	MD-D	1.5	34.1	46.3	18.1	4.6	64.6	1.4	8.1	3.2	11500	6½	2600	
	Clayey carbonaceous silt shale	0.1-0.2	S	Bk to gy bk																						

SITE/STATION NO. 7-9 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
			S																							
	Coal	0.9-1.0		Bk	B			X				X	B- MB	1.7	32.8	45.4	20.1	4.6	63.6	1.4	7.5	2.8	11260	6½	2530	
			S																							
0.6-1.8	Underclay			Md gy																						
			S																							
	Coal	0.4		Bk	B			X			X	X	M- MB	1.8	36.6	50.8	10.8	5.1	71.9	1.5	8.6	2.1	12820	7	2350	
			S																							
4.2-4.6	Clayey carbonaceous silt shale	0.0-0.4		Bk																						Vitrain lenses.
			S																							
	Coal	3.8		Bk	B	X				X	X	X	M- MB													Reported thickness. Not accessible.

SITE/STATION NO.	7-10 (page 1)	COUNTY:	Washington			COAL SAMPLE NO(S).:	402227/801608/3A, -/3B,
COMPANY:	Mac Coal Co.	LAT. °N:	40°22'27"	ELEV. (base lower coal):	Appx. 1100'		-/3C, -/9
MINE:	Mac No. 4	LONG. °W:	80°16'08"	TWP.:	Robinson		
PERMIT:	199-6	GEOLOGIST:	WEE	15' QUADRANGLE:	Burgettstown	JOINTING:	N5W, N85W
SAMPLING METHOD:	Channel	DATE:	7-10-69	7 1/2' QUADRANGLE:	Midway		
REPORTED COAL NAMES:	Pittsburgh "roof" coal, Pittsburgh "rooster" coal					WEATHERING:	Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS												
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL									PROXIMATE (%)				ULTIMATE (%)					BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
					Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN							Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR				
						ABUNDANCE				THICKNESS																
						> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2mm														
6+	Sandstone		G	Lt bn gy																						Fine grained. Beds to 1' thick.
11	Silty clay shale		G	Lt ol gy																						
5.5	Clay shale		G	Md dk gy to gy ol																						
1.0	Clay shale		G	Gy bk																						Siderite nodules. Plant fossils.
0.5	Clay shale		S	Gy bk																						
0.5	Siltstone		S	Dk gy																						
1.6	Clay shale		G	Dk gy																						
3-5	Limestone		G	Md to lt gy																						Two or 3 beds separated by thin shale.
1.7	Claystone		S	Gy bk to dk gn gy																						
12-7	Limestone		G	Md to lt gy																						Thins as claystone below thickens. Two or 3 beds.
9-14	Claystone		G	Gn gy																						Thins as limestone above thickens.
12	Claystone to clay shale		G	Gn gy																						Some limestone bands.
8	Clay shale to claystone			Md dk gy																						Limestone nodules and bands in upper half.

SITE/STATION NO. 7-10 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
4.5	Silt-clay laminite shale		G	Dk to md dk gy																						Plant fossils.
0.5	Carbonaceous clay shale		G	Bk																						Approaches bone coal.
0.2	Clay shale		G	Md dk gy																						
1.80	Coal		S	Bk	N								M-MD	1.8	33.1	44.9	20.2	4.5	63.1	1.4	7.7	3.1	11200	5½	2580	Pittsburgh "rooster" coal. Canneloid appearance. Rough to hackley.
0.3-0.9	Carbonaceous clay shale		G	Bk																						
0.5	Coal		S	Bk																						
0.8-2.0	Silt shale		S	Md dk gy																						
0.0-0.2	Silt shale		G	Dk gy to gy bk																						Vitrain lenses.
0.2-0.3	Coal		S	Bk	B		X				X	X	B-MB													Blocky.
0.0-2.5	Carbonaceous clay shale		S	Dk gy																						Plant fossils.
0.2	Coal		S	Bk	B		X				X	X	M-MB													Blocky.
0.6-0.8	Silt shale		S	Dk to md dk gy																						

SITE/STATION NO. 7-10 (page 3)	COUNTY:	COAL SAMPLE NO(S).:
COMPANY:	LAT. °N: ELEV. (base lower coal):	
MINE:	LONG. °W: TWP.:	
PERMIT:	GEOLOGIST: 15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE: 7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:		WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
0.2	Siltstone		G	Gy bk																						Vitrain lenses. Pyrite.
1.9-2.1	Coal	1.0	S	Bk	B		X				X	X	M-MB	1.6	31.3	42.7	24.4	4.3	59.4	1.3	6.4	4.2	10570	7	2190	Pittsburgh "roof" coal. Blocky.
	Clay shale	0.1-0.2	S	Dk gy																						Plant fossils.
	Coal	0.6	S	Bk	B		X				X	X	M-MB	1.8	36.0	48.6	13.6	4.8	68.1	1.4	6.7	5.4	12250	7½	2030	Pittsburgh "roof" coal. Blocky.
	Carbonaceous silt shale	0.1	S	Gy bk																						Vitrain lenses.
	Coal	1.9	S	Bk	B		X					X	B-MB	1.7	33.4	48.1	16.8	4.7	65.7	1.4	7.5	3.9	11730	7½	2110	Pittsburgh "roof" coal. Blocky.
1.3	Clay shale		S	Ol gy																						
-	Coal		S	Bk																						Main bench of Pittsburgh seam. Not exposed.

SITE/STATION NO. 17-3
COUNTY: Washington
COAL SAMPLE NO(S).: 401604/800105/2
COMPANY: Mineral Excavating Co.
LAT. °N: 40°16'04"
ELEV. (base lower coal): Appx. 1090'
MINE:
LONG. °W: 80°01'05"
TWP.: Union
PERMIT: 609-1
GEOLOGIST: WEE
15' QUADRANGLE: Carnegie
JOINTING: Coal: N68W, N20E; shale: N83W
SAMPLING METHOD: Channel
DATE: 8-26-71
7 1/2' QUADRANGLE: Bridgeville
REPORTED COAL NAMES: Redstone
WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)			ULTIMATE (%)									
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
7+	Silty sandstone		?	Lt ol gy																						Weathered. Silt to very fine grained.
14	Clayey silt shale		G	Ol gy to md gy																						Weathered. Plant fossils.
0.5	Clay shale		S	Bk																						
2.5	Limestone		S	Md gy																						
2	Silty sandstone		G	Md gy to gn gy																						
19	Silty clay shale		G	Md lt gy to bl gy																						
5.5	Clay shale		G	Md gy to gy bk																						Few sandstone lenses to 0.3'.
0.2	Shaly coal		G	Bk	N								D													
3.2	Coal	0.3	G	Bk	B		X					X	M	2.8	33.3	51.0	12.9	4.9	69.9	1.5	8.4	2.4	12490	8	2450	
	Coal	1.0	G	Bk	B				X			X	B													
	Coal	1.9	S	Bk	B				X			X	M													
0.5+	Underclay			Md lt gy																						

SITE/STATION NO.	18-1	COUNTY:	Washington		COAL SAMPLE NO(S).: 400919/800239/2 and 400919/800239/4
COMPANY:	Twilight Industries	LAT. °N: 40°09'19"	ELEV. (base lower coal): Appx. 1100'		
MINE:		LONG. °W: 80°02'39"	TWP.: Somerset		
PERMIT:	1-29	GEOLOGIST: WEE	15' QUADRANGLE: Amity		JOINTING: Coal: N66W, N25E, and N40E
SAMPLING METHOD:	Channel	DATE: 8-9-71	7 1/2' QUADRANGLE: Hackett		
REPORTED COAL NAMES:	Waynesburg				WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Grain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Sandstone		S	Vy lt gy																						
9.6	Interbedded sandstone, sand-silt laminite and clay shale		G	Md lt gy to md dk gy																						
1.6	Clay shale		S	Md dk gy																						
1.0	Coal		S	Bk	B			X				X	MB	2.6	32.6	43.4	21.4	4.7	62.0	1.4	7.6	2.9	11130	7½	2240	Some pyrite.
1.2	Claystone		S	Md gy																						
3.7	Coal		S	Bk	B				X			X	M	1.7	36.8	46.5	15.0	5.0	68.7	1.5	7.4	2.4	12380	7	2760	Some pyrite.
-	Underclay			Md to md dk gy																						Plastic. Mine floor.

SITE/STATION NO. 28-4

COMPANY:

MINE:

PERMIT:

SAMPLING METHOD:

REPORTED COAL NAMES: Waynesburg

COUNTY: Washington

LAT. °N: 40°10'53"

LONG. °W: 79°58'52"

GEOLOGIST: WEE

DATE: 7-19-74

ELEV. (base lower coal): 1110'±

TWP.: Fallowfield

15' QUADRANGLE: Brownsville

7 1/2' QUADRANGLE: Monongahela

COAL SAMPLE NO(S).: None

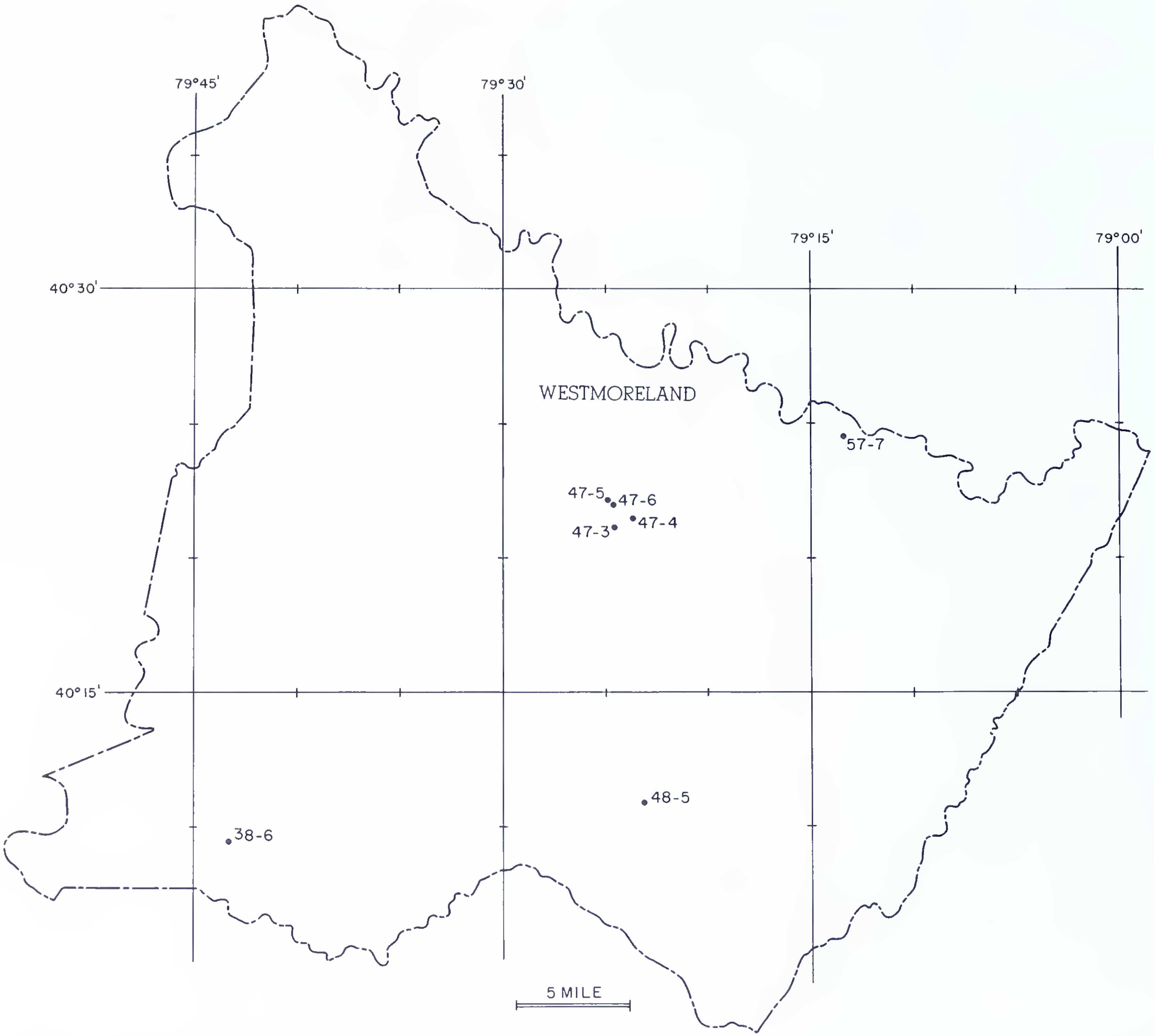
JOINTING:

WEATHERING: Very weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
9.0+	Clayey siltstone		S	Md gy																						
0.8	Coal		S	Bk	B				X			X	M													
1.5	Claystone (underclay)		S	Md gy																						
3.2	Coal		S	Bk	B				X			X	M													
0.3	Claystone (underclay)			Md gy																						

SITE/STATION NO. 28-5	COUNTY: Washington	COAL SAMPLE NO(S).: 400923/795951/2A,
COMPANY: Nat-Industries, Inc.	LAT. °N: 40°09'23" / ELEV. (base lower coal): Appx. 1080'	400923/795951/2B, and 400923/795951/2C
MINE:	LONG. °W: 79°59'51" / TWP.: Fallowfield	
PERMIT: 582-1	GEOLOGIST: WEF / 15' QUADRANGLE: Brownsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 8-9-71 / 7 1/2' QUADRANGLE: Monongahela	
REPORTED COAL NAMES: Waynesburg coal		WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1+	Coal blossom			Bk																						Very weathered.
3	Underclay		S	?																						Very weathered.
11	Silty clay shale		G	Ol gy																						
0.5-1.0	Limestone		G	Md gy																						
2-3±	Claystone		G	Md dk gy																						Abundant limestone nodules to 0.1'.
0-1±	Claystone		G	Gy bk																						
16.5	Claystone		G	Lt ol gy																						Limestone nodules.
1.0	Clayey, silty sandstone		G	Lt bn gy																						Fine grained.
14.5	Interbedded clay shale and silt shale		G	Lt ol gy to lt bn gy																						
3.0	Silty claystone to clay shale		G	Md dk gy																						Plant fossils.
5.8	Coal	1.05	S	Bk										5.1	31.7	45.2	18.0	4.9	62.9	1.4	11.6	1.2	11130	5	2710	
	Claystone	1.1	S	Md to dk gy																						Plant fossils.
	Coal	2.6	S	Bk										4.5	34.8	48.1	12.6	5.1	71.1	1.5	8.3	1.4	12130	5½	2680	Few pyrite lenses.
	Claystone	0.3	S	Md gy to gy bk																						Plant fossils.
	Coal	0.75	S	Bk										8.4	28.4	42.8	20.4	4.7	57.6	1.3	14.5	1.5	10070	1	2170	
-	Underclay		S	Lt gy																						


79°45'
79°30'
79°15'
79°00'
40°30'
40°15'
WESTMORELAND
57-7
47-5
47-6
47-3
47-4
48-5
38-6
5 MILE

SITE/STATION NO. 38-6	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 400928/794317/1A, 400928/794317/1B
COMPANY: Twilight Industries	LAT. °N: 40°09'28"	ELEV. (base lower coal): Appx. 1040'	
MINE: Stahl Strip	LONG. °W: 79°43'17"	TWP.: South Huntingdon	
PERMIT: 1-15	GEOLOGIST: WEE	15' QUADRANGLE: Connellsville	JOINTING:
SAMPLING METHOD: Channel	DATE: 7-30-69	7 1/2' QUADRANGLE: Smithton	
REPORTED COAL NAMES: Redstone			WEATHERING: Weathered

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
-	Coal blossom			Bk																						Very weathered.
2	Clay shale to claystone		?	?																						Very weathered.
10	Calcareous claystone		G	Lt ol gy																						
23	Clay shale		G	Md to md dk gy																						Large siderite nodules. Limestone nodules, mostly in top 3'.
3.5-5.0	Clay shale		G	Dk gy																						Siderite nodules and bands.
4.30±	Coal	0.2-0.8	S	Bk	N								M-MB	1.1	32.2	51.4	15.3	4.7	70.3	1.6	4.9	3.2	12520	8½	2130	Irregular fracture.
	Carbonaceous siltstone	0.05-1.75	S	Gy bk																						Vitrain lenses.
	Coal	3.45	S	Bk	B			X				X	M-MB	1.2	31.0	55.9	11.9	4.9	73.6	1.6	6.4	1.6	13000	9	2680	Irregular fracture.

SITE/STATION NO. 47-3

COMPANY: North Cambria Fuel, Inc.

MINE:

PERMIT:

SAMPLING METHOD: Face channel

REPORTED COAL NAMES: Reported as Bakerstown, more likely Upper Freeport(?)

COUNTY: Westmoreland

LAT. °N: 40°21'03"

LONG. °W: 79°24'35"

GEOLOGIST: WEE

DATE: 7-15-74

ELEV. (base lower coal): 1210'±

TWP.: Unity

15' QUADRANGLE: Latrobe

7 1/2' QUADRANGLE: Latrobe

COAL SAMPLE NO(S).: 402103/792435/2

JOINTING:

WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
45+	Sandstone			Md lt gy																						
0.0-4.0	Clay (weathered from clay shale)		U	Md gy, yl gy																						
2.6-3.4	Coal		G	Bk	B			X				X	MB	2.0	32.3	50.8	14.9	4.8	70.1	1.1	5.3	3.8	12740	8½	2080	Three or 4 irregular partings in lower 1.5'.
0.3+	Claystone (underclay)		S	Md to md dk gy																						

SITE/STATION NO. 47-4	COUNTY: Westmoreland		COAL SAMPLE NO(S).: None
COMPANY: North Cambria Fuel, Inc.	LAT. °N: 40°21'32"	ELEV. (base lower coal): 1130'±	
MINE:	LONG. °W: 79°23'38"	TWP.: Derry	
PERMIT: 10-34	GEOLOGIST: WEE	15' QUADRANGLE: Latrobe	JOINTING:
SAMPLING METHOD:	DATE: 7-16-74	7 1/2' QUADRANGLE: Latrobe	
REPORTED COAL NAMES: Reported as Bakerstown, probably Upper Freeport(?)			WEATHERING: Fresh

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Bonded (B), Non-Bonded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
45+	Sandstone			Lt gy																						
3.0-12.0	Silt shale and sand-silt laminite		U	Dk and md lt gy																						Plant fossils. Siderite zones and nodules.
Reported as 3.3	Coal		S	Bk																						Top only exposed. Thickness reported by supervisor.

SITE/STATION NO. 47-5
COMPANY:
MINE: Roadcut
PERMIT:
SAMPLING METHOD:
REPORTED COAL NAMES: Uncertain
COUNTY: Westmoreland
LAT. °N: 40°22'06"
LONG. °W: 79°24'56"
GEOLOGIST: WEE
DATE: 7-16-74
ELEV. (base lower coal): 1030'±
TWP.: Unity
15' QUADRANGLE: Latrobe
7 1/2' QUADRANGLE: Latrobe
COAL SAMPLE NO(S).:
JOINTING:
WEATHERING: Weathered

STRATIGRAPHIC DATA: THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	COAL: Banded (B), Non-Banded (N), or Mixed (M)	VITRAIN ABUNDANCE > 60%	30-60%	15-30%	< 15%	VITRAIN THICKNESS > 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	COAL ANALYSIS: PROXIMATE (%) MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	ULTIMATE (%) HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
6.0+	Clay shale			Bn bk to dk gy																						
5.5	Sandstone		S	Yl gy to ol gy																						
3.0	Sand-silt laminite		G	Gy bk and md gy																						
0.1-0.2	Coal		S	Bk	N								MD													
1.0	Claystone (underclay)		S	Md gy																						
4.0+	Calcareous claystone		G	Yl gy																						Limestone nodules ¼".

SITE/STATION NO. 47-6	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 402150/792443/2
COMPANY: North Cambria Fuel, Inc.	LAT. °N: 40°21'50"	ELEV. (base lower coal): 1100'±	
MINE:	LONG. °W: 79°24'43"	TWP.: Unity	
PERMIT:	GEOLOGIST: WEE	15' QUADRANGLE: Latrobe	JOINTING: Coal: N70W (face), N14E (butt); sandstone: N73W, N18E
SAMPLING METHOD: Face channel	DATE: 7-16-74	7 1/2' QUADRANGLE: Latrobe	
REPORTED COAL NAMES: Reported as Brush Creek, probably Mahoning(?)			WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Claystone (underclay)		?																							Very weathered.
14.0-10.0	Interbedded sandstone, sand-silt laminite, and clayey silt shale		G	Md lt gy, md gy, and ol gy																						
8.0-13.0	Sandstone		U?	Vy lt gy, lt gy, and lt ol gy																						Pinches out to NW and SE.
0.5-1.5	Sandstone and sand-silt laminite		G	Md gy																						Top 0.5' weathered to yellow clay.
0.5-1.5	Clay shale		S	Md dk gy																						Plant fossils.
2.0	Coal		S	Bk	B		X				X	X	B	2.2	30.4	59.5	7.9	5.1	76.8	1.3	5.6	3.3	13760	8½	2030	Several thin, discontinuous partings.
0.1+	Silty claystone (underclay)			Md gy																						

SITE/STATION NO. 48-5 (page 1)
COMPANY: C. W. Brown Coal Co.
MINE:
PERMIT: 273-4
SAMPLING METHOD: Face channel
REPORTED COAL NAMES: Uncertain

COUNTY: Westmoreland
LAT. °N: 40°10'54"
LONG. °W: 79°23'05"
GEOLOGIST: WEE
DATE: 8-17-74

ELEV. (base lower coal): 1110'±
TWP.: Donegal
15' QUADRANGLE: Donegal
7 1/2' QUADRANGLE: Mammoth

COAL SAMPLE NO(S).: 401054/792305/2A, 401054/792305/2B, 401054/792305/2C
JOINTING: Sandstone: N42E, N37W, N10W, N64W; coal: N4E, N63W, N27E
WEATHERING: Weathered

STRATIGRAPHIC DATA														COAL ANALYSIS												
					COAL									PROXIMATE (%)				ULTIMATE (%)								
						VITRAIN																				
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60 %	30-60 %	15-30 %	< 15 %	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
5.0+	Sandstone		U?	Lt to vy lt gy																						
6.0	Clayey silt shale		S																							Very weathered.
2.1	Coal		S	Bk																						Very weathered.
1.5	Silty claystone (underclay)		G																							Very weathered.
5.0	Clayey silt shale		G	Lt ol gy																						
3.0	Silty clay shale		G	Md gy to lt ol gy																						
1.0	Claystone and clay shale		S	Md dk gy																						
0.3	Clay		S	Mod bn																						Wet and plastic.
3.0	Interbedded calcareous silty claystone and limestone nodules		G	Lt ol gy to md gy																						
4.0	Silty claystone		G	Lt ol gy																						
5.0	Clayey siltstone		G	Md lt gy																						
32.5	Interbedded silty sandstone and sand-silt laminite			Dk to md lt gy and lt ol gy																						Flat, even beds.

SITE/STATION NO. 48-5 (page 2)	COUNTY:		COAL SAMPLE NO(S).:
COMPANY:	LAT. °N:	ELEV. (base lower coal):	
MINE:	LONG. °W:	TWP.:	
PERMIT:	GEOLOGIST:	15' QUADRANGLE:	JOINTING:
SAMPLING METHOD:	DATE:	7 1/2' QUADRANGLE:	
REPORTED COAL NAMES:			WEATHERING:

STRATIGRAPHIC DATA					COAL									COAL ANALYSIS												
						VITRAIN								PROXIMATE (%)				ULTIMATE (%)								
						ABUNDANCE				THICKNESS																
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded (B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5 mm	1/2-2 mm	Clarain-Durain Luster (bright, mod-bright, mid-lustrous, mod-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS
1.0	Clay shale		S	Dk to md dk gy																						
0.2	Claystone		S	Dk gy to gy bk																						
3.4	Interbedded carbonaceous clay shale and bone coal	0.5	S	Gy bk to bk	B		X					X	MD	1.7	18.8	34.1	45.4	3.1	42.9	0.7	5.9	2.0	7610	3½	2880	
	Carbonaceous clay shale	0.1	S	Gy bk to bk																						
	Coal	0.8	S	Bk	B		X				X	X	M	2.2	29.8	60.4	7.6	4.9	77.9	1.3	5.3	3.0	13860	8½	2140	
	Coal	2.0	S	Bk	B			X				X	MB	1.6	26.5	55.4	16.5	4.4	70.9	1.1	4.2	2.9	12570	6½	2450	
2.0+	Claystone (underclay)		S	Md to md lt gy																						

SITE/STATION NO. 57-7	COUNTY: Westmoreland		COAL SAMPLE NO(S).: 402440/791322
COMPANY: Acko Coal Corp.	LAT. °N: 40°24'39"	ELEV. (base lower coal): Appx. 1160'	
MINE:	LONG. °W: 79°13'25"	TWP.: Derry	
PERMIT: 561-1	GEOLOGIST: WAB	15' QUADRANGLE: New Florence	JOINTING: Coal: N71W, N25E
SAMPLING METHOD: Channel	DATE: 8-10-71	7 1/2' QUADRANGLE: Bolivar	
REPORTED COAL NAMES: Upper Freeport			WEATHERING: Fresh

STRATIGRAPHIC DATA														COAL ANALYSIS													
					COAL									PROXIMATE (%)			ULTIMATE (%)										
						VITRAIN																					
						ABUNDANCE				THICKNESS																	
THICKNESS (FEET)	LITHOLOGY	Thickness of benches, if individually analyzed or described (FT)	CONTACT (S=Sharp, G=Gradational, U=Uncon.)	COLOR	Banded(B), Non-Banded (N), or Mixed (M)	> 60%	30-60%	15-30%	< 15%	> 5 mm	2-5mm	1/2-2mm	Clarain-Durain Luster (bright, med-bright, mid-lustrous, med-dull, dull)	MOISTURE	VOLATILE MATTER	FIXED CARBON	ASH	HYDROGEN	CARBON	NITROGEN	OXYGEN	SULFUR	BRITISH THERMAL UNITS / POUND	FREE-SWELLING INDEX	ASH-SOFTENING TEMPERATURE (°F)	COMMENTS	
15.0+	Clay and soil			Md dk to md gy																						Probably represents Pleistocene fluvial deposit.	
9.0	Sandstone		G	Md lt to vy lt gy																						Large festoon crossbeds.	
2.9	Coal		S	Bk	B			X		X	X		B	1.0	26.9	62.3	9.8	4.6	77.3	1.3	5.2	1.8	13740	9	2480	Shiny, bright, brittle.	
1.0+	Claystone		S	Md dk to md lt gy																						Mine floor. Underclay. Rooted.	

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